ABSTRACT

Title of Document: **PLAYING FOR REAL: DESIGNING ALTERNATE REALITY GAMES IN LEARNING CONTEXTS**

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Alternate Reality Game (ARG) represent a new genre of transmedia practice where players hunt for scattered clues, make sense of disparate information, and solve puzzles to advance an ever-evolving storyline. Players participate in ARGs using multiple communications technologies, ranging from print materials to mobile devices. However, many interaction design challenges must be addressed to weave these everyday communication tools together into an immersive, participatory experience. Transmedia design is not an everyday process. Designers must create and connect story bits across multiple media (video, audio, text) and multiple platforms (phones, computers, physical spaces). Furthermore, they must engage with players of varying skill levels. Few studies to-date have explored the design process of ARGs in learning contexts. Fewer still have focused on challenges involved in designing for youth (13-17 years old).

In this study, I explore the process of designing ARGs as vehicles for promoting information literacy and participatory culture for adolescents (13-17 years old). Two ARG design scenarios, distinguished by target learning environment (formal and informal context) and target audience (adolescents), comprise the two cases that I examine. Through my analysis of these two design cases, I articulate several unique challenges faced by designers who create interactive, transmedia stories for – and with – youth. Drawing from these design challenges, I derive a repertoire of design strategies that future designers and researchers may use to create and implement ARGs for teens in learning contexts. In particular, I propose a narrative design framework that allows for the categorization of ARGs as storytelling constructs that lie along a continuum of participation and interaction. The framework can serve as an analytic tool for researchers and a guide for designers. In addition, I establish a framework of social roles that designers may employ to craft transmedia narratives before live launch and to promote and scaffold player participation after play begins. Overall, the contributions of my study include theoretical insights that may advance our understanding of narrative design and analysis as well as more practical design implications for designers and practitioners seeking to incorporate transmedia features into learning experiences that target youth.

PLAYING FOR REAL: DESIGNING ALTERNATE REALITY GAMES IN LEARNING CONTEXTS

By

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Dissertation submitted to the Faculty of the Graduate School of the
University of Maryland, College Park, in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
2016

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Dedication

"How far that little candle throws its beams.
So shines a good deed in a naughty world."

The Merchant of Venice, by William Shakespeare

For those whose lights have never failed to spark my curiosity and growth as a daughter, mother, and learner:

Dad

Mom

Joe

Michael and Matthew

Acknowledgements

As numerous scholars have noted innumerable times before me: No worthwhile task is done with the support of a number of talented colleagues, scholars, and friends. Success in most things boils down to collaboration and collegiality. More specifically, anyone who has had the incredible opportunity to work with Allison Druin in the University of Maryland's iSchool and Human Computer Interaction Lab (HCIL) has also come to realize that we can create some pretty amazing things if we include children fully in our research and design projects -- especially if we listen carefully to the stories that children tell as we design together.

So, to preface my gratitude to the oh-so-many incredible individuals who have pushed me further and lifted me higher than I ever imagined I could rise, I'd like to share a simple, but personally meaningful story.

The story is from the book, *Madlenka*, which was written by award-winning children's book author and illustrator, Peter Sís. Madlenka is a little girl who lives in inner city New York. Her entire world is bounded by the crowded city block she lives within. As a tiny element nestled within the bustling latticework of avenues, boulevards, parks, and museums that crisscross the expansive metropolis, Madlenka's world seems an insignificant speck. But, oh, what an incredibly rich and variegated tapestry of friends and mentors embraces Madlenka as she grows! One morning -- on the particular morning that Sís opens his story -- Madlenka wakes up to find that her tooth is loose. Now: anyone who has watched a child will realize that a loose tooth signifies an important transition from being a little kid to being a big kid; an initial passage from transient childhood traits to defining characteristics that one will carry

for a lifetime. Madlenka is so excited about her loose tooth and the shift it signifies that she spends the entire day running around her city block, sharing the news with all the people who've influenced her in her seven short years of life: "My tooth is loose!" Her tooth is loose, and she will be a big kid soon. And so, to all the fabulous people who, like Madlenka's friends and family, have shepherded me to this one important moment: Thank you. Thank you for guiding me so that I can say, "My tooth is loose!" and cross this threshold to complete my dissertation.

Below I name but a few of the countless individuals who have contributed to my growth and accomplishments:

I am indebted to my committee members: Ira Chinoy, Kari Kraus, Derek Hansen, June Ahn, and most especially, to my chair, long-time mentor, and colleague, Allison Druin. Special props to Kari for bearing witness, and to Derek for his insightful feedback and indefatigable support.

Huzzah and thanks to my lovely colleagues and cheerleaders, Tammy Clegg, Dana Rotman, Jes Koepfler, Katy Lawley, Ben Bederson, Lana Yarosh, Jenny Preece, Alex Quinn, Charley Lewittes, Anne Rose, Leyla Norooz, Brenna McNally, Sheri Massey, Mega Subramaniam, Beth St. Jean, Greg Walsh, Jeff DiScala, Ann Weeks, Daniel Pauw, Tony Pellicone, Carlea Holl-Jensen, Katie Kaczmarek, Chelsea Hordatt, Jason Yip, Mona Leigh Guha, Leah Findlater, Jon Froelich, Tamara Peyton, Sarah McRoberts, Amanda Waugh, Carol Boston, Christina Pikas, Natalie Greene Taylor, Kathleen Fominaya, Daisy Mason, Kathy Weaver, Bobby Beaton, Mike "Mr Teller" Dickson, Steve Shumway, Jared Cardon, Jeff Parkin, Jeff Sheets, Amanda Visconti, Ann Fraistat, Tan Xu, Ping Wang, Anastasia Salter, Zach Toups, Lennart

Nacke, Carman Neustaedter, Vicki Moulder, Yvonne Lopez, Carol Klyver, Belinda Zoller, Debbie Fields, Yasmin Kafai, and countless others who I may have neglected to name here, but have not forgotten in my heart.

Much love and gratitude to my special family: Michael McGinn; Joseph Bonsignore, Sr.; Joanne and Rick Azzarano; Ayako and Hirotsugu Maeda and Takako, Hiroko, Yoko, Naoko, Yukiko, and Masumi; Kaneko and Eisuke Nakaza; Michiyo and Hideki; and Rumiko and Emiko. I can never express enough my love and appreciation for my boys, Michael and Matthew, whose unwavering faith supported me across every milestone; and my mom and dad, to whom this dissertation is dedicated. To my husband, Joe, who encouraged me to chase a lifelong dream and supported my every antic as I worked to realize that dream: I love you and am so grateful that we can share not only milestones like this, but also, our lives together. Last but never least: Thanks to God, for everything and all.

Table of Contents

Dedication ii

Acknowledgements.....iii

Table of Contents vi

List of Tables viii

List of Figures ix

Chapter 1: Introduction: What is an Alternate Reality Game? 1
- 1.1 The Story 1
- 1.2 Background and Motivation for Research 4
- 1.3 Research Questions and Framework 9
- 1.4. Research Plan and Scope 10
- 1.5. Contributions of the study 12
- 1.6. Chapter Summary and Outline for chapters ahead 13

Chapter 2: Literature Review and Analysis of Existing ARGs 17
- 2.1 Survey of Ecological Models: Where and why they are used 17
- 2.2 Conceptual Framework: Information Ecology 19
- 2.3 Classifying Existing ARGs as Information Ecologies 20
- 2.4. What current research says about: Interaction Design, Transmedia, and Literacy 48
- 2.5. Summary 79

Chapter 3: Methodology 80
- 3.1 Review of the Research Questions 80
- 3.2 The Embedded Multiple Case Study Design 82
- 3.3 Data Collection 91
- 3.4 Data Analysis 94

Chapter 4: *AGOG* Case Study 97
- 4.1 Purpose of the AGOG Embedded Case: Designing for Collaboration 97
- 4.2 Collaboration, ARGs, and Cooperative Learning 99
- 4.3 Embedded Case: Cooperative Learning in AGOG 103
- 4.4 Tailoring ARG Features for Teen Audiences 121
- 4.5 Summary of the Chapter 133

Chapter 5: *Finksbrary*: A Case Study of Rural Public Library ARG Design ... 134
- 5.1 Case Study Overview 134
- 5.2 The Finksbrary ARG Team Launches and Evolves 142
- 5.3 The Final Finksbrary ARG: Run Red Run 162
- 5.4 Discussion: Implications for ARG Design from the Finksbrary Team 191
- 5.5 Finksbrary: Concluding Thoughts and Potential for Future Research 203

Chapter 6: Discussion and Findings 205
- 6.1 AGOG and Finksbrary: Case Comparisons/Contrasts 206
- 6.2 AGOG and Finksbrary as Information Ecologies 209
- 6.3 Extending the Information Ecologies Framework 226
- 6.4 Future Opportunities: Literacies Practiced by Puppetmasters 247
- 6.5 Participatory Design for a Participatory Game 258

Chapter 7: Conclusion **261**
7.1 Contributions **261**
7.2 Limitations **266**
7.3 Looking to the Future **268**
Glossary **270**
Bibliography **274**

List of Tables

Table 2.1 *Sample of ARGs classified as systems of diverse components. (1 of 3 pages)..... 28*
Table 2.2*: Highlighting the Narrative-Centric Keystone Species in the representative ARG sample 44*
Table 2.3 *Unique examples of Keystone Species that emerged and evolved during gameplay..... 45*
Table 2.3 *Comparison of in-game (Story World) and out-of-game localities within each ARG in the sample. (1 of 3 pages) 49*
Table 2.4: *ARGs and Videogames: Comparison across interaction components..... 56*
Table 3.1 *Data Collection Overview 92*
Table 4.1*: Elements of Cooperative Learning mapped to AGOG design features.....107*
Table 4.2: *Comparing ARG features to most traditional videogames.....122*
Table 5.1: *Summary of Finksbrary ARGs (2008-2011).....136*
Table 5.2*: Timeline, Goals and Description of the Finksbrary ARG Team monthly design sessions. 164*
Table 6.1*: Sample Blog posts created by the Finksbrary Teen Designers.....251*

List of Figures

***Figure 1.1**: Images from the Arcane Gallery of Gadgetry (AGOG).....2*
***Figure 1.2:** Students study clues and encode messages in AGOG.....3*
***Figure 2.1:** Sample design document from The Beast (Dena, 2008b).....25*
***Figure 2.2:** Lute Tablature (sample shown here).....26*
***Figure 2.3:** Sample design flowchart used by MetaCortechs (Project MU) Puppetmasters.....35*
***Figure 2.3:** Multimedia versus cross-media versus transmedia.....62*
***Figure 2.4**: Cross-media and transmedia comparison: The Matrix versus Harry Potter.....63*
***Figure 3.1:** Types of Case Study Designs.....84*
***Figure 3.2:** AGOG / Finksbrary adaptation of Yin's (2003) multiple case study, embedded design. 89*
***Figure 4.1**: The AGOG Players' Working Wall of Evidence.....110*
***Figure 4.2:** AGOG Final Mission Design, Initial Brainstorming Mind-Map.....111*
***Figure 4.3.** AGOG Final Mission Design Document, mapping game artifacts to individual Order clues/challenges.....112*
***Figure 4.4:** More student player notes from the AGOG Working Wall of Evidence.....113*
***Figure 4.5:** Sample Status Wall Updates (Students to each other and April).....116*
***Figure 5.1:** Finksbrary ARG Team.....140*
***Figure 5.2**: Sample slides from McGonigal's videoconference with the Finksbrary teens.....143*
***Figure 5.3:** A snapshot of the promotional video for Find Chesia.....145*
***Figure 5.4:** Excerpt from the Find Chesia design wiki, August 2008 – May 2009.....148*
***Figure 5.5:** Find Chesia "Invite Objects" and bracelets (like the protagonist, Chelsie's, gem-bracelet).....151*
***Figure 5.6:** Find Chesia Design Wiki excerpt, May 28, 2009.....152*
***Figure 5.7:** Brainstorming "what worked/what didn't work" in Find Chesia.....155*
***Figure 5.8:** Mystery Guest logos, created by Rosie.....158*
***Figure 5.9:** Run Red Run November 2010 session design notes.....166*
***Figure 5.10.** McGonigal's "10 Steps to Inventing and ARG" and "4 Secrets" to an awesome ARG...175*
***Figure 5.11**: Design notes and sketches from the Run Red Run video trailer design session.....181*
***Figure 5.12** Run Red Run storyline and interactive puzzles as a path-planning network diagram.....184*
***Figure 5.13:** The final draft of Red's introductory blog post.....186*
***Figure 5.14:** A sample of the final blog posts from Run Red Run.....188*
***Figure 5.15**. The text of the two final blog posts, created by Heather and her Finksbrary team.....189*
***Figure 5.16:** The thrill of "Launching ARGs."....190*
***Figure 6.1:** Reprint of Yin's (2003) embedded unit-of-analysis design, adapted for the AGOG and Finksbrary cases.....210*
***Figure 6.2:** AGOG Middle-school players listening to April.....217*
***Figure 6.3** ARG Narrative Design Dimensions (Continuum of Open-ended to Close-ended).....230*
***Figure 6.4:** ARG Narrative Design Dimensions, with ARGs in learning contexts highlighted.....231*
***Figure 6.5**: Visual Diagrams for ARG Narrative Designs.....247*
Figure 7.1 Repertoire of Design Strategies, represented as a "design deck" of cards.....266

Chapter 1: Introduction: What is an Alternate Reality Game?

1.1 The Story

> *"It seems there is a chronology protection agency, which prevents the appearance of closed timelike curves, and so makes the universe safe for historians" (Hawking, 1992, p. 603).*

In the spring of 2011, a curious quantum phenomenon took place. A group of middle school students from suburban Maryland witnessed a compelling contradiction to the "chronology protection conjecture" of renowned physicist, Stephen Hawking, which asserts that the laws of physics do not allow time travel (Hawking, 1992). At 12:00am on April 15th, 2011, time folded back onto itself, creating a path in 4-dimensional space-time that enabled the transmission of a message from 2011 to 1853. The message sent was not just any message. Its scattered contents, which guaranteed the preservation of United States' history as we know it today, had been encrypted and hidden for over a century.

A few weeks prior to this peculiar event, the students had accepted an invitation to become members of the secret, benevolent JENIUS[1] *cohort. Together with another young JENIUS member known as "April G", they authenticated documents, deciphered clues, and decoded maps to reconstruct the mysterious message. In the end, their collective ingenuity enabled April to transmit the reassembled message just in time to take advantage of the momentary chronological rift. Her 2011 warning to members of the society in 1853 ensured the safety of several special inventions – gadgets the students had learned might otherwise be used to change the course of the Civil War. Together, April and the students helped make "the universe safe for historians," though not exactly as Hawkings once surmised.*

[1] Junto of Enlightened Naturalists and Inventors for a United Society (*JENIUS*).

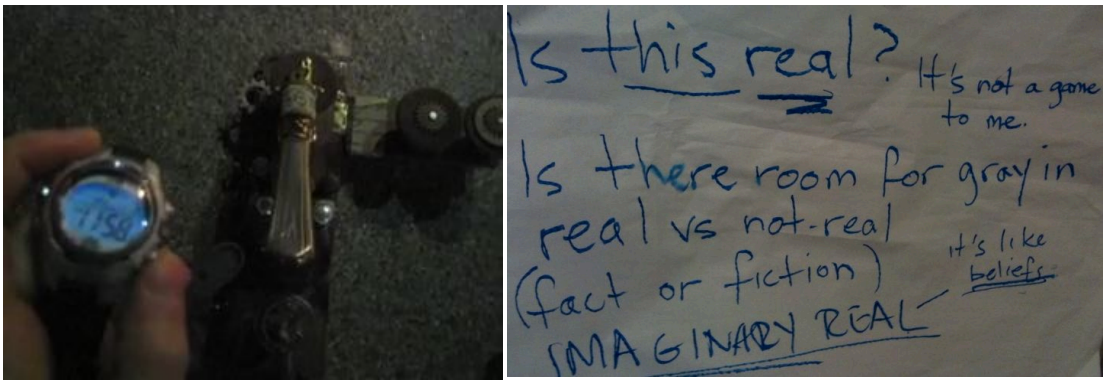


Figure 1.1: Images from the Arcane Gallery of Gadgetry (*AGOG*).
The image on the left captures a climactic moment just before the in-game character, April, transmitted the message to JENIUS members in the past. She used an in-game invention based on the 19th century telegraph. On the right, researchers recorded students' questions and comments in brainstorming sessions during *AGOG*.[2]

The account presented here really happened, according to the group of middle school students who participated in the *Arcane Gallery of Gadgetry*, an Alternate Reality Game designed to expose them to the mathematical roots of cryptography and cartography, the problem-solving methods that spark invention, and the interpretive process behind history. Not long before the quantum entanglement[3] that enabled their special message to be sent, university researchers asked the students to help investigate a set of historical artifacts allegedly discovered by a staff member from the Smithsonian American Art Museum (SAAM). The researchers briefed the students on the *Junto*, an actual but secret philanthropic society founded by one of America's founding fathers (Ben Franklin). They invited the students to be part of a modern, fictional version of the *Junto*, known as *JENIUS* (*Junto of Enlightened Naturalists and Inventors for a United Society*). The students discovered that *JENIUS* is an underground extension of the original *Junto*, and that its purpose is to curate a

[2] Unless otherwise indicated, all *AGOG* photographs composed/edited by the author.
[3] In quantum physics, time is considered a side effect of quantum entanglement. The way that time can be viewed changes depending on where observations are being made (Moreva et al., 2014; "Quantum Experiment Shows How Time 'Emerges' from Entanglement," 2013).

special subset of covert Patent Office designs known as the *Arcane Gallery of Gadgetry*. They accepted responsibilities as *JENIUS* archivists, cryptographers, surveyors, and inventors and embarked on training missions to acquire skills specific to their chosen specialties. For two weeks, the students and researchers gathered and evaluated historic evidence, decoded data embedded within historic maps, and tinkered with technology in an effort to piece together the relevance and purpose of the Gallery artifacts that the SAAM personnel had uncovered.

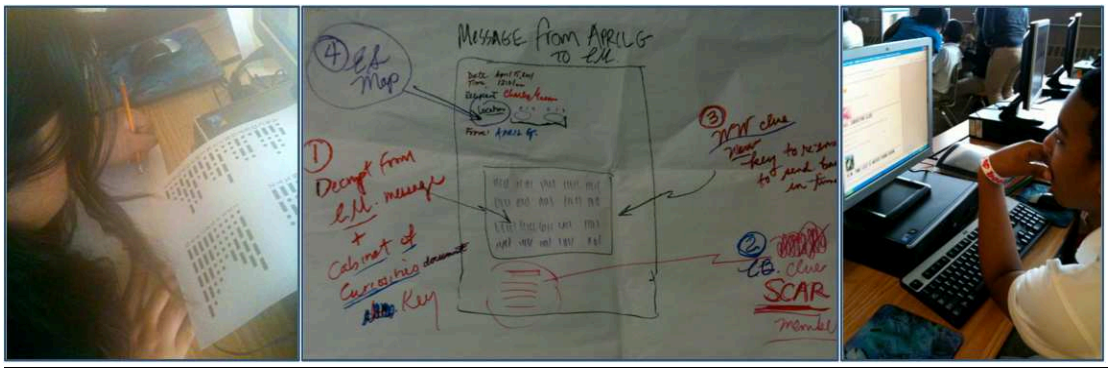


Figure 1.2: Students study clues and encode messages in *AGOG*.
The graph-like diagram in center reflects notes about the clues, and connections between them.

By blurring the lines between fiction and reality, the game encouraged the students to interpret the information presented in their classes in entirely new ways. They were required to take on investigative roles in disciplines as diverse as geography, cryptography, and archives. Whenever information in extant historical records was missing or suspect, such as an unexplained fire in the SAAM building that once housed the US Patent Office, they were encouraged to play with the available data and extrapolate plausible alternatives. Furthermore, the students were active co-constructors of their experience, almost as responsible for advancing the storyline as the researchers who crafted the overall narrative arc. Although key, pre-scripted story bits were meted out when related puzzle challenges were solved, the

students often interacted dynamically with the narrative content and characters. The designers had to respond in near real-time to student questions about the unfolding story, and manage unexpected student reactions. While the game's fictitious elements may seem contrived, the inquiry process the students followed to connect disparate data into a coherent narrative is not very different from methods used by professional scientists and humanists.

The endgame for the *Arcane Gallery of Gadgetry* (*AGOG*) was not to assess the skills or knowledge acquired by the students using traditional assessment techniques, such as standardized tests. Rather, a primary goal for *AGOG* was to explore and implement design features that could engage the students in 21st century literacy practices, such as critical thinking, information evaluation, and collaboration ((AASL) American Association of School Librarians, 2008; Jenkins, Clinton, Purushotma, Robinson, & Weigel, 2006). A related goal was to understand which technological, narrative, or game-based components could support the students as they acquired and honed these literacy skills. *AGOG* is part of a larger, design-based research initiative that explores the potential of Alternate Reality Games (ARGs) to create authentic contexts for collaborative learning and participatory design. *AGOG* is also one of two design cases in the research presented in this dissertation. My investigation focuses on the design of ARGs as participatory storytelling systems that can engage players in 21st century literacy practices in authentic, real-world contexts.

1.2 Background and Motivation for Research

An Alternate Reality Game (ARG) is a form of transmedia storytelling (Jenkins, 2006) whose narrative context is not bound within any single communications platform or media type. Its story fragments can be scattered and

hidden on billboards, in websites, phone calls, text messages, or books (Kim, Lee, Thomas, & Dombrowski, 2009; Martin, Thompson, & Chatfield, 2006). Most importantly, an ARG is a participatory storytelling experience. Because of the ways in which an ARG's narrative elements are hidden, players must collaboratively hunt for clues, solve puzzles, and synthesize disparate information to assemble and advance its ever-evolving storyline (J. Y. Kim, Allen, & Lee, 2008a; McGonigal, 2003a). An ARG rendition of a Sherlock Holmes mystery, for example, might involve Watson sending players a text message with GPS coordinates to the next clue, which the players must find, decode and email to Holmes before the story can continue. Rather than being confined to the pages of a book or the reels of a film, the story spills out into the everyday world. Rather than taking on imaginary roles or using avatars, players participate as themselves. Just as the ARG's narrative is distributed across "real-world" platforms, players use "real-world" technologies such as blogs, chat, and online community forums to collaborate as they make sense of the unfolding story. During the *Arcane Gallery of Gadgetry* (*AGOG*), in-game characters delivered narrative clues via podcasts, video and blog posts; likewise, players shared information that they uncovered about the narrative using Facebook-like status updates, blog posts, and a community wiki.

As highly social, interactive media experiences, ARGs have received increasing interest across commercial and academic enterprises. Examples of popular commercial ARGs include *The Beast*, used to promote the film, *A.I*, and *The Lost Experience*, used to retain and attract viewers to the popular television series, *Lost*. Although ARGs have been used primarily for entertainment, they are garnering

attention as a potentially transformative vehicle for education, specifically in terms of information literacy and collaborative sense-making (Bonsignore, Hansen, Kraus, & Ruppel, 2012; M. Johnson, Clapp, Ewing, & Buhler, 2011; Whitton, 2008). A small number of ARGs have already been developed with educational goals in mind, such as *World Without Oil*, which asked players to imagine their world in the midst of a global oil crisis, inviting them to take the opportunity to "Play it – before you live it" (http://www.worldwithoutoil.org, Zetter, 2010). These education-oriented ARGs can be enacted on a global scale, such as *Urgent Evoke*, an award-wining ARG that attracted over 20,000 players from 150 countries to brainstorm solutions to the world's "most urgent social problems" (Alchemy, 2010a). Alternatively, they can be targeted at a local level, such as *ARGOSI*, which engaged a small number of new students at a university in the U.K. to practice information literacy skills with classmates while exploring their school's neighboring community (Whitton, 2008).

As immersive learning experiences, ARGs possess unique characteristics in terms of context and player participation. A primary contextual goal is "to take the substance of everyday life and weave it into narratives that layer additional meaning, depth, and interaction upon the real world" (A. Martin et al., 2006, p. 6). ARG designers achieve this goal by embedding story and interactive challenges into relatively accessible, everyday communications technologies, such as websites, phones, and print materials. By design, then, ARGs can offer authentic contexts for players to learn and practice 21st century literacies, such as evaluating and sharing information across multiple media, and using new media tools to re-interpret existing

content or to create new expressions (AASL, 2008; (P21) Partnership for 21st Century Skills., 2009; Jenkins et al., 2006).

The ARG's porous boundary between fictional game world and "real world" presents both opportunities and challenges. By embedding game play and story seamlessly into existing technologies, ARG designers often strive to "deny and disguise the fact that it is even a game" (Szulborski, 2005, p. 1). Known as the "This is Not a Game" (*TINAG*) ethos by ARG designers and players, it can be the game's primary apparatus for prompting critical thinking and information evaluation practices, because players are responsible for distinguishing "truth" from fiction. However, striking a meaningful balance between fact and fiction using the *TINAG* mantra poses an ethical dilemma for designers, particularly those who work within educational contexts that place high value in the accuracy and authenticity of information (e.g., schools, libraries, museums).

In addition to these contextual design components, ARGs possess unique characteristics in terms of player participation. First, players engage with ARG content and each other as themselves, not a fictional character or avatar. "ARGs do not require there be an avatar to build up…There is, rather, the insertion of additional slices of reality into our own, and the only demand is that you interact with these as yourself" (A. Martin et al., 2006, p. 7). This direct, personal connection with ARG content holds potential for players to internalize and transfer what they have learned into sense-making and problem-solving strategies that they can apply in their own lives. Players assume a central role in assembling the story world, by collecting, connecting, and sharing the distributed story bits that comprise the game's narrative.

Because ARGs "present the evidence of that story, and let the players tell it" (McGonigal, 2008a, p. 202), players often begin to view *themselves* as detectives, storytellers, and problem-solvers (McGonigal, 2003a). Furthermore, most ARG designers demand that players collaborate to gather and assemble the story pieces, by creating "puzzles and challenges that no single person could solve on their own" (McGonigal, 2008a, p. 203). Thus, in addition to their authentic contexts, well-designed ARGs are uniquely situated to support 21st century literacy practices such as collaborative problem-solving and sense-making (Bonsignore et al., 2012; M. Johnson et al., 2011; Whitton, 2008).

As a participatory storytelling system, the ARG narrative must be flexibly structured to interact in real-time with players. ARG designers must often respond dynamically to the input that their players provide, such as adding new content early because puzzles are solved more quickly than expected, or changing the fate of an in-game character based on player suggestions (J. Y. Kim et al., 2008a; A. Martin et al., 2006). Once the ARG has begun, players can have as much influence as designers in how the narrative and game-play advances (J. Y. Kim et al., 2008a; McGonigal, 2008a). This dynamic interaction between designers and players from launch to conclusion, along with the real-world context of ARGs, also presents new opportunities for designers to evaluate existing and emergent collaborative technologies beyond lab settings. Designers could assess the utility and relevance of emergent technologies by writing them into ARG story lines, then observing how players adopt, use, abandon, or repurpose them during game play and beyond. Participatory design sessions could be scripted into an ARG, enabling designers and

players to co-create tools that support their collaborative discovery and sense-making activities. Effectively, ARGs represent a sweet spot for design and user evaluations because they are situated between the relatively inauthentic lab context and completely natural, uncontrolled "real-world" contexts. The tight coupling between designer and player poses a unique opportunity to explore participatory design techniques for collaborative sense-making technologies.

1.3 Research Questions and Framework

Prior research has focused on the ways in which ARGs recruit players, and the various collaborative sense-making strategies players employ while the game is in progress (Dena, 2008a; McGonigal, 2007, 2008a; Niemeyer et al., 2009). While these studies draw upon the design process of the ARG to inform their analyses, design discussions are incidental, not central. Few have converged specifically on the design processes involved, the interdisciplinary skills required for successful design, or the ways in which designers might frame and scaffold student learning. My study aims to shift the research focus to the design process for ARGs. Taking the promise of ARGs as learning platforms seriously, I seek to systematically investigate how the machinery and conventions of ARGs can be used to support 21st century literacy practices ((AASL) American Association of School Librarians, 2008; Bonsignore, Hansen, Kraus, & Ruppel, 2012; Jenkins et al., 2006; (P21) Partnership for 21st Century Skills., 2009).

An ARG can be described as an *information ecology*, (Nardi, & O'Day, 2000), or a complex, interrelated system of people (designers/players), practices, and technologies, situated within a dynamic transmedia environment. ARG designers and players come from diverse, multidisciplinary backgrounds, and the social and

technical practices of both groups co-evolve during design and game-play. By using the *information ecology* analogy as an organizing framework, ARGs can be examined as the interactive, participatory narrative systems they are. For example, the *information ecology* notion of a "keystone species whose presence is crucial to the survival of the ecology itself" (Nardi, & O'Day, 2000, p. 53) can be applied to formally describe key roles, responsibilities and skill sets required when designing ARGs for learning.

Using an information ecology metaphor as an organizing framework, I have explored ARG design through the following analytic lenses and associated research questions:

- *ARGS through the lens of interaction design*: What challenges do design teams face when designing ARGs? What design choices and tradeoffs must ARG designers deal with? How must ARGs be modified for a young teen audience?
- *ARGs through the lens of curricular design*: How can ARG-design enable and foster collaborative learning and 21st century literacy practices? How can we map the design and play mechanics of ARGs to the curricular design and classroom delivery mechanics of lesson plans?

1.4. Research Plan and Scope

I have investigated responses to these questions using a mixed method, multiple-case study research framework. Case studies are characterized by a close examination of complex systems (Lazar, Feng, & Hochheiser, 2010), within a real-life context, when responses to "how" or "why" questions are the goal (Yin, 2009). As described, ARGs represent complex ecosystems designed for, and enacted within,

real-world contexts. Two ARG design scenarios, distinguished by target learning environment (formal or informal context), comprised my cases. For the first case, I have analyzed the ways in which the *Arcane Gallery of Gadgetry* targeted players in a formal education context (i.e., middle school). For the second case, I have explored the design processes used by a small design team (two librarians and three teens) as they implemented ARGs that were integrated into their local public library's summer-reading program (informal, out-of-school context). I used an embedded design, which, in addition to a main case, includes embedded units of analysis that can add operational focus to large, system-based or abstract studies (e.g., of projects, communities) (Yin, 2003, 2009). For my case study design, analysis of the ARG design and implementation process formed the main case in each context (formal and informal learning). For my embedded units of analysis within each case, I have focused on specific learning-targeted design processes followed by designers (in both formal and informal learning contexts), literacy skills and behaviors that I observed players practicing during game-play (in the formal learning context), and literacy skills and behaviors that the young ARG designers themselves enacted (in the informal learning context).

Nardi and O'Day's (2000) information ecology framework supports a holistic, system-based investigation because it encompasses the study of interrelationships and dependencies among system components in addition to the system components themselves. However, their ecological metaphor also includes a scoping structure via the concept of *locality*, or the ways in which people and technologies interact within specific contexts of use (Harris, 2003, p. 176; Nardi, & O'Day, 2000, pp. 54–56). My

investigation directs its attention to ARGs in learning contexts, bound in time by the life cycle of each ARG design case. In the formal learning context, I bound my study with the design and implementation of one ARG. In the informal learning context, my study is bounded by a specific group of designers (one youth services librarian and three teens, 12-17 years old) who designed and implemented three summer reading ARGs over a three-year period.

1.5. Contributions of the study

My research goal was to systematically analyze and formally describe the processes and challenges involved in the design of ARGs, from initial concept through endgame. While my investigative focus was on the design process of ARGs for learning, my research findings hold potential to extend beyond ARG design alone. First, ARGs represent an emergent form of distributed storytelling connected across multiple media and platforms. Consequently, a matrix of narrative and interaction strategies that helps ARG designers and players decide which communications technologies and/or narrative devices "tell the story best" can contribute to cross-media interaction design research. For example, the ways in which different characters present the narrative – or make it accessible to players – may motivate different players to connect with the ARG's interactive components in different ways. In addition, a repertoire of design patterns that support literacy and learning goals within ARGs may extend to similar immersive, collaborative learning environments, especially for youth (13-17 years old). Although not central to my empirically driven investigation, a theoretical analysis of the close coupling between designer and player during game-play may also reveal opportunities to involve players directly in the

improvement and design of tools they use to collaborate, given that ARGs also represent a subset of collaborative sense-making systems overall.

My contributions include an articulation of several unique challenges faced by designers who create interactive, transmedia stories for – and with – youth. Drawing from these design challenges, I have also derived a repertoire of design strategies that future designers and researchers may use to create and implement ARGs for teens in learning contexts. In particular, I have proposed a narrative design framework that allows for the categorization of ARGs as storytelling constructs that lie along a continuum of participation and interaction. The framework can serve as an analytic tool for researchers and a guide for designers. In addition, I have established a framework of social roles that designers may employ to craft transmedia narratives before live launch and to promote and scaffold player participation after play begins. Overall, the contributions of my study include theoretical insights that may advance our understanding of narrative design and analysis as well as more practical design implications for designers and practitioners seeking to incorporate transmedia features into learning experiences that target youth.

1.6. Chapter Summary and Outline for chapters ahead

In this chapter, I provided background on ARGs, highlighting the importance of investigating and describing models for ARG design, especially in terms of the literacy practices and collaborative learning that they can enable. I proposed the information ecology model as a pertinent theoretical framework for studying ARGs, because ecological models emphasize interactions and interrelationships, and ARGs are complex systems of interrelated multi-media formats, conveyed across multiple platforms, shared by a diverse collective of players. Specific research questions were

articulated, and a multi-case-study design was outlined. I concluded by identifying the main categories of contributions to HCI and education research that will be made throughout this study.

My dissertation is organized into 7 chapters including this introductory chapter (i.e., Chapter 1), which defines ARGs, outlines their potential as transformative learning platforms, and establishes the motivation for my study. In Chapter 2, I set the stage with a literature review and survey of existing ARGs that examines the current state of ARGs through three different analytic lenses. First, I use Nardi and O'Day's (2000) information ecologies' model to analyze and categorize a collection of past ARGs. I include research about ARG design and player participation patterns in my review. This descriptive analysis is complemented by an examination of ARGs through the lens of Interaction Design, in which I compare and contrast ARGs with other interactive experiences such as digital videogames and transmedia storytelling systems. To return my research focus to the design of ARGs within learning contexts, I synthesize learning sciences' literature on New Media Literacies (Coiro, Knobel, Lankshear, & Leu, 2008; Jenkins et al., 2006; Lankshear & Knobel, 2003; Leu, Kinzer, Coiro, & Cammack, 2004; The New London Group et al., 1996), underscoring the potential for ARGs to be authentic learning experiences, and highlighting opportunities for ARG designers to explicitly engineer learning interaction and assessment elements into ARG experiences. I conclude the chapter by identifying points at which an information ecologies' framework does not adequately inform designer efforts to create ARGs with learning goals in mind. Thus, Chapters 1

and 2 define key terminology and relate important issues from prior research to my work.

In Chapter 3, I outline my overall research design, reviewing my research questions, the two case studies, data collected, and analytic methods used. Chapters 4-6 comprise the empirical examination of two ARG designs for learning: one in a formal context (middle school social studies class); the other in an informal context (public library youth services program). Chapter 4 summarizes and evaluates the *AGOG* ARG, my design case in a formal learning context. I first focus my embedded analysis on the *AGOG* design team's efforts to integrate cooperative learning theory into the game mechanics and narrative, and associated player outcomes the team observed during gameplay. I include a detailed review of the design processes followed by the *AGOG* design team from the ARG's conception through endgame. In Chapter 5, I shift gears from a formal learning context to an informal learning one, and provide an in-depth look at a small ARG design team at a local Maryland public library. I review the evolution of the design processes they followed over the course of their implementation of three "summer reading program" ARGs, calling attention to both the goals they worked toward, and the constraints under which they operated. Chapter 6 provides a cross-case study analysis and discussion, with implications of the findings, specifically for ARG designs that may be practically implemented in either formal (in-school) or informal (out-of-school) contexts. Chapter 7 addresses the limitations of my study, explores opportunities for future research, and concludes with a summary of contributions that can be used by researchers and practitioners to

both analyze and design participatory transmedia systems such as ARGs, with a focus on designing for youth in learning contexts.

Chapter 2: Literature Review and Analysis of Existing ARGs

In this chapter, I review the ways in which ecological metaphors have been applied across various research domains, such as human-computer interaction (HCI), education, and game studies. Next, I analyze existing ARG studies using the information ecologies' model as a conceptual framework. I also survey the extant research in transmedia storytelling and 21st century literacy frameworks to lay the groundwork for crafting responses to the questions that guide my study. To establish a common vocabulary for design-based discussion and analysis, I include definitions of concepts such as transmedia and 21st century literacies, highlighting each concept's relevance to my investigation into ARG designs in learning contexts. Throughout this examination of the research landscape, I call attention to relatively unexplored elements of ARG design that may benefit from my case study analysis, such as the need to codify means for connecting story fragments across narrative delivery platforms, and to integrate players' learning activities authentically into the game narrative and mechanics.

2.1 Survey of Ecological Models: Where and why they are used

Beyond their roots in biology and the natural sciences, ecological models and metaphors have been applied in a wide variety of disciplines over the past several decades. Researchers who have employed ecology-based frameworks represent domains as diverse as psychology and human development (Bronfenbrenner & Evans, 2000; Bronfrenbrenner, 1994; Lewin, 1931), education (Barron, 2004; J. S. Brown, 2000; Looi, 2008), economics (Moore, 1993), game studies (Salen, 2008), human-computer interaction (Cosley et al., 2008; Crabtree & Rodden, 2008; Fischer, 2011; Forlizzi, 2008; Nardi, & O'Day, 2000), knowledge management (Bicocchi et

al., 2010; Davenport, 1997; Pór, 2000), library science (Harris, 2003), online community studies (Nardi, & O'Day, 2000), and social network analysis (Finin et al., 2008). All of these studies argue that ecological metaphors enable the rich characterization of complex systems as they arise and evolve in response to larger environmental forces, such as rapidly changing information/communications technologies or dynamic global economies. Further, ecological models often reveal key components that can ensure the self-sustainability of the system, or support its positive responses to change. This knowledge, in turn, spotlights areas within the ecosystem that can benefit from new designs or interventions. Commonly recurring themes in these studies include:

- A focus on context, and the interdependence of component elements;
- A recognition of the evolving and self-organizing nature of ecological systems;
- A celebration of diversity as a means for supporting adaptability; and
- An appreciation for "keystone species" (Nardi, & O'Day, 2000) crucial for long-term survival of the ecosystem.

While all of these studies use ecological metaphors to characterize their objects of research or prescribe recommendations for improving them, they can be further categorized by the ways in which they focus their analysis. Most ecological models are system-based, encompassing the people, practices, and technologies of an organization (e.g., business company, hospital unit, community of gamers) within their scope of study (Davenport, 1997; Moore, 1993; Nardi, & O'Day, 2000, 2000; Pór, 2000; Salen, 2008). In these cases, the entire ecosystem itself, along with the

relationships and dependencies among its component parts, comprises the phenomenon being studied. Others focus on the technological components within the ecosystem, and organize their analysis around a complex of interrelated objects, such as a collection of online resources, or a specific set of consumer products (Brown, 2000; Finin et al., 2008; Forlizzi, 2008). Ecological perspectives in education and human development typically situate the person (e.g., child) as the central node around which the investigation of the ecosystem is structured (Barron, 2004, 2006; Bronfenbrenner & Evans, 2000; Bronfrenbrenner, 1994). Because an ARG comprises an interdependent system of technologies, people, activities, artifacts, and processes, my study is structured using a systems-based ecological model: specifically, the information ecology model.

2.2 Conceptual Framework: Information Ecology

Just as ecology in life science focuses on the interactions and interrelationships between living organisms and their local environment (Odum & Barrett, 2005; Simpson & Weiner, 2009), an information ecology focuses on the evolving interactions and interrelationships between people and the communications technologies they use in a particular environment (Nardi, & O'Day, 2000). An information ecology is characterized by five key attributes:

- It is a **system** of interrelated parts;
- It contains **diverse** elements that increase its ability to adapt to change;
- Its interrelated components **co-evolve** together;
- It is grounded in a **local** setting, which enables bounded study of its components; and
- It possesses **keystone species** necessary for its survival.

Because it is a metaphor that evokes commonly recognized biological concepts, the information ecology is an intuitive conceptual framework. At first glance, its distinguishing features can seem deceptively simple (e.g., "a system of interrelated parts"). Taken together, they offer a useful organizing framework for describing complex phenomena like ARGs. The term ecology implies continual evolution, adaptability, and change (Nardi & O'Day, 2000), evoking a temporal dimension that extends the expressive ability and sustainability of our analysis. The information ecology's property of co-evolution, coupled with the interdependence of its individual components, captures the ARG's zeitgeist that designers and players constantly adapt in response to one another's actions and feedback. Further, an information ecology is a heterogeneous, not homogeneous system. Its diversity affords us opportunities (and challenges) to interpret ARGs from multiple perspectives.

2.3 Classifying Existing ARGs as Information Ecologies

By enlisting the information ecology attributes as design dimensions, we can formally describe the interrelated parts that make up an ARG (spatially), as well as their interactions over the life cycle of an ARG (temporally). In the following sub-sections, I detail each attribute in turn, using examples from existing ARG implementations, from both academic and popular literature. I apply these features as an organizing framework to dissect and classify a representative sample of ARGs (Tables 2.1-2.3). These attributes can also serve as a blueprint that informs future ARG design decisions. The following criteria were used for selecting the sample of ARGs classified in Tables 2.1-2.3:

- Identified as "seminal" or model ARG by designers and scholars. For example, *The Beast* is commonly referred to as the "first" ARG (J. Y. Kim et

al., 2009; A. Martin et al., 2006), and *Perplex City* was one of the first self-supported ARGs.

- Distinguished by mission or purpose. For instance, early ARGs served as marketing tools in the entertainment industry. Others were designed to raise awareness of and mobilize action in response to major social issues, such as an impending global oil shortage (*World Without Oil*) or disaster preparedness and solving the world's clean water crisis (*Urgent Evoke*). A small number were designed with educational goals in mind, such as information literacy practices and environmental science (*ARGOSI*, *Black Cloud*).
- Distinguished by primary narrative delivery platform. A growing number of print books extend their stories into other media, such as character blogs, websites for fictional businesses, working phone numbers and email addresses (*Cathy's Book*, *Personal Effects: Dark Art*).

2.3.1 System

An ecosystem is composed of interrelated entities whose individual qualities and contributions may be very different (Salen & Zimmerman, 2003). Consider the members of the ARG's design team, which typically includes creative writers, graphic designers, puzzle-makers, web designers, and community liaison/outreach leads (A. Martin et al., 2006). The ARG's vehicles for delivering narrative are likewise diverse, as they can be billboards, blog posts, interactive chat, books, or live events (Martin et al., 2006; Szulborski, 2005). The "Why so Serious" marketing campaign for the 2008 *Batman* movie*, The Dark Knight*, is a prime example of transmedia storytelling that showcases the ways in which each media format enriched

and expanded the story world. For 18 months, the "Why so Serious" designers fabricated a singular, immersive story experience by weaving elements of the *Batman* mythology through websites, newspapers, live events, short videos, even *Batman* signals and graffiti on city buildings (Thompson, 2010).

The ecosystem's entities are not only individually distinct; they are also interdependent. A change to one component affects the whole. For example, during the ARG, *I Love Bees (ILB)*, players completely changed the fate of one character in the game. The *ILB* designers had assumed that players would sympathize with a character known as the Sleeping Princess and help protect her. Instead, the players revealed her hiding place to another in-game character, and the "designers had no choice but to let the Princess be captured by the enemy in the next round of the *ILB's* story update" (Kim et al., 2008, p. 41). The players effectively up-ended the narrative arc the designers had initially planned for the Princess. The key factor that makes the individual entities in an ARG a "system" lies in the relationships between them and the roles each entity takes on to keep the system working. This interdependence of individual components also influences the way they co-evolve, which is addressed in more detail in section *2.3.3*.

In some cases, a change at the component level alters the ecology's defining characteristics entirely. Writers may create a rich narrative, but if it lacks interactive hooks by which players can engage with and potentially influence its outcomes and arc, then the story they have developed may not be considered a true ARG. If players can interact with the story as they experience it across various media (via phone calls,

on the web), but they are not required to collaborate with others, designers may disagree whether it can be classified as an ARG (Kim et al., 2009).

In 2008, an ARG-like experience called *Free Fall* was created to promote the movie, *Eagle Eye*. In *Free Fall*, the player responds to instructions given by a secret entity via phone and website interaction, in order to piece together a fragmented plot about a possible murder (a storyline similar to the movie itself). However, *Free Fall's* timeline is compressed to about 10 minutes, and is played individually, not in collaboration with others. A player enters her name and optionally, her phone number to start the game. Within a few seconds, the player's phone rings, and s/he is drawn into the story as a woman asks for help in finding a fugitive. For the next 5-10 minutes, characters from the movie call the player, demanding help. While the short story does push itself into the player's "real world" by making a jarring phone call and demanding a password, the outcome is pre-determined and the player's interaction with the call is limited. The online component also limits interaction, offering only one or two options for players to click on a web link or enter a code, each with heavily guided prompts (e.g., "*Enter the license plate number you see on the screen*"). Kim et al. (2009) argue that *Free Fall* is therefore more "interactive trailer" than ARG, because it lacks the collaborative, community experience, despite its use of multiple media (audio, video, text) and platform (web, phone) and compelling, realistic interaction with the player.

However, other ARG designers claim that *Free Fall* is an example of how the realm of transmedia design has expanded to include more scalable, re-playable experiences. Jordan Weisman and Sean Stewart, who were leaders of the creative

teams that developed the canonical ARGs, *The Beast* and *I Love Bees*, relate these massive, collaborative, one-time experiences to rock concerts (Dahlen, 2008). In contrast, they assert that experiences like *Free Fall* still fit within the definition of ARGs and transmedia, but as shorter, less expansive excursions. As Sean Stewart explains: "It's really difficult to work having a giant rock concert all the time. … If the concert is multiplayer [and] takes place in real time…what's the album? It's the experience you can have by yourself, and you can have it even six months later. … *The Beast* was both a serial, living in time, and multiplayer and cross-platform. So how about we strip out the time-elapsing thing and make a re-playable, single player cross-platform thing?" (personal interview, Dec 17, 2010). The design of *Free Fall* illustrates how ARG designers are experimenting with the genre to accommodate challenges such as scalability and re-playability (Hansen, Bonsignore, Ruppel, Visconti, & Kraus, 2013). Note that while Table 2.1 includes the classification of ARG ecosystems that can be experienced on a more individual level, such as *Cathy's Book*, my study focused on understanding the design process needed for ARG ecosystems that include collaboration and shared learning activities among multiple players (13-17 years old).

2.3.2 Diversity

Just as different species fill functional niches that ensure the survival and advancement of a biological ecology, the people, technologies, and processes in an information ecology fill distinct functions and play multiple roles. As noted in the **system** section (2.3.1), diversity is a core characteristic of an ARG, whether it manifests itself in the multiple skill sets represented in its design team (e.g., creative

writer, puzzle maker, web master) or the variety of media used to deliver its story. Each element contributes uniquely to the success of the ecosystem overall. To keep track of all the in-game resources and their interconnections, ARG designers often use visual flowcharts or network maps. An example from the designers of The Beast is shown in Figure 2.1.

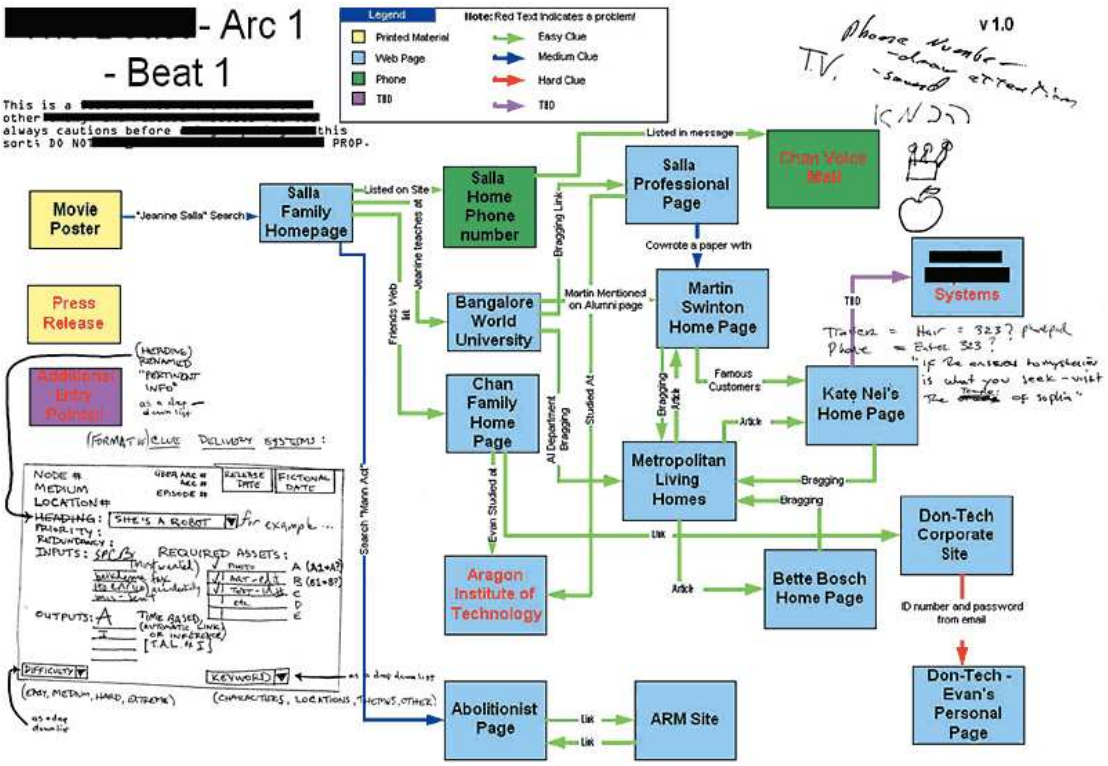


Figure 2.1: Sample design document from The Beast (Dena, 2008b).

From an educational perspective, the variety of puzzles employed during an ARG hold learning potential beyond collaborative problem solving. First, they enable players from a wide range of disciplines to participate actively in some aspect of uncovering the story, with each player feeling as though s/he can contribute something meaningful to the community's efforts. *The Beast* designers repeatedly voiced their amazement in the players' individual contributions, often citing the 2-3 players among almost 3 million who solved a puzzle that required knowledge of Lute

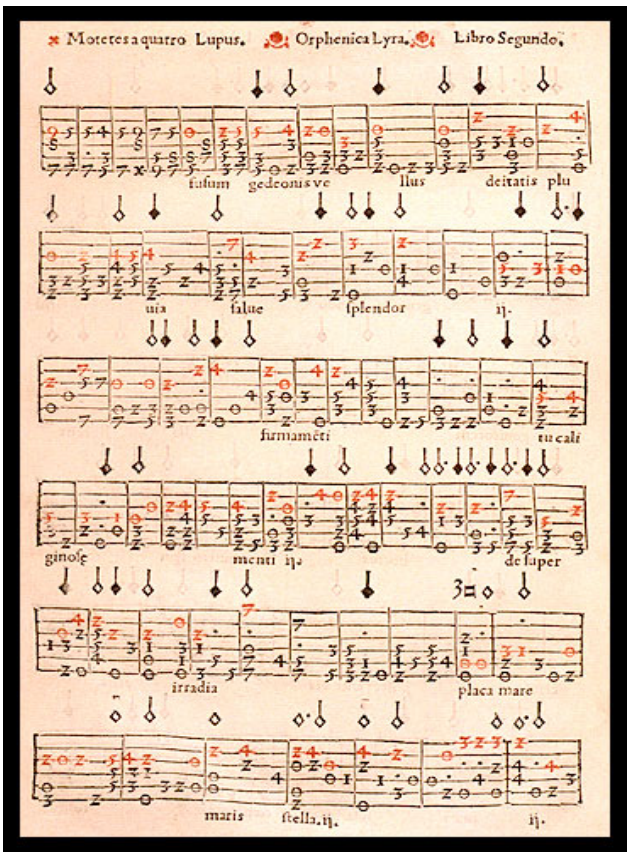


Figure 2.2: Lute Tablature (sample shown here).
Esoteric expertise in Lute Tablature (sample shown here) was required to solve one of the over 100 puzzles/challenges players of The Beast encountered.[4]

tablature (Figure 2.2). Lead creative writer, Sean Stewart, explained the balance they sought between individual participation and collective detective work: "*every week we wanted one puzzle that would be, for one person out there, "OHMIGOD! **I'M** a Xenobotanical musicologist!!!!! …Then when you have TWO lute players, though, you know you're on to something*" (Seitz, 2001). In addition, the ARG player and puzzle diversity supports opportunities for individuals to be exposed to new fields and problem sets. Andrea Philips, ARG player and community moderator-turned-transmedia writer/producer, responded this way when asked about the learning

[4] Public domain image reproduced from Wikimedia Commons, (Moreva et al., 2014; "Quantum Experiment Shows How Time 'Emerges' from Entanglement," 2013).

potential of ARGs: "*Look, I'm never going to solve an Enigma-encrypted message by myself, right? But because of the ways we worked together to figure out the story in The Beast*, *I was exposed to things that I would never have thought of before*" (A. Phillips, personal interview, Dec 21, 2011). Here, ARGs represent a novel participatory learning environment of the kind promoted by technologist and learning scholar, John Seely Brown, in which students are given opportunities "to find and join niche communities where they can benefit from opportunities for distributed cognitive apprenticeship" (J. S. Brown, 2008, p. 29).

Table 2.1 lays out a representative sample of ARGs from 2001-2010 according to the information ecology dimensions of system and diversity. The overarching purpose for each ARG is also included, to distinguish among those created as marketing tools for the entertainment industry, those focused on social issues or learning outcomes, and more book-based experiences that contain ARG-based components.

2.3.3 Coevolution

Species in a biological ecosystem evolve and adapt in response to changes in weather, migration patterns of other organisms, and related environmental shifts. A change in one element affects another. The co-evolution of constituents is constant, so that the overall system "is not static, even when it is in equilibrium" (Nardi & O'Day, 1999, p. 52). Information ecologies exhibit similar dynamics. The transformations that occur are both social and technical, because people find new ways to use existing tools, and tools fill new niches as people share and modify them to serve unforeseen functions. In ARGs, the most overt evidence of its coevolving parts is seen in the

Table 2.1 Sample of ARGs classified as systems of diverse components. (1 of 3 pages)

ARG Example	Diversity/Distribution of System Components			Purpose
	People (Focus is on Designers)	**Media/Platforms**	**Challenges (clues, puzzles)**	
The Beast (2001) ~ 3million players (One group of active members generated over 40,000 messages in its community forum)	- Creative Writers - Graphic designers - Game/Puzzle designers - Live Actors	- Websites/Blogs - Live Web Chat - Live Phone calls - Phone numbers to call, with pre-recorded messages - Emails - Videos - Posters - Faxes/fax machines - Audio clips - Wiki (player-created)	- Steganography - Literary allusions - Encoded/encrypted messages (hidden html/code) - Language/symbol translation (anagrams, arcane languages) - Mathematical/logic puzzles - Audio/video decoding - Network protocol puzzles - Research on scientific phenomena	Marketing campaign for movie, *A.I.*
Project MU "Metacortechs" (2003) ~ 8300 players	- Multi-talented "fans" and ARG aficionados (included creative writers, web developers, graphic artists, puzzle and game developers)	*Most of the above, plus the following*: - Book that served as "archive"/guide (created by players) - CDs containing puzzles/clues	*All of the above, plus the following*: - Scavenger Hunts (to find physical artifacts, in this case, CDs)	Fan-fiction extension of the *Matrix* Universe (movies' series). Developed by fans, for fans; not affiliated with film producers.
I Love Bees "ILB" (2004) ~ 3million players (~100,000 "Active")	- Creative Writers - Graphic designers - Game/Puzzle designers - Live Actors - Community Liaisons/leads	- Packages received in the mail - Voice clips sent to pay phones - One primary website - One primary blog site - Live events	*All of the above, plus the following*: - Geographic (GPS) coordinates - Morse code	Marketing campaign for Xbox® game, *Halo 2*
Perplex City (2005-2007) ~50,000 registered players	- Story Team - Tech Team - Puzzle Team - Art Team - Audio Cast - Ops Team - Live Event Support Staff - "Guest" writers, artists	*Most of the above, plus the following:* - Collectible Puzzle cards - Map of Perplex City - Newspaper Ads	*Most of the above, plus the following:* - Collectible Puzzle Cards, with embedded clues (e.g., messages written in heat-sensitive ink, logic riddles, math problems)	First project by "social, multi-player game"[5] developer, Mind Candy. Note: In the ARG's credits, the designers categorize themselves by team "types".[6]

[5] Mind Candy advertizes its company as a leading developer of "social multi-player games". http://mindcandy.com/ (accessed Dec 2011)

[6] Perplex City "Credits." http://seasonone.perplexcitystories.com/credits.html

ARG Example	Diversity/Distribution of System Components			Purpose
	People (Focus is on Designers)	**Media/Platforms**	**Challenges (clues, puzzles)**	
Lost Experience (2006)	- Producer - Creative Writers - Game/Puzzle designers - Live Actors	*All those listed for The Beast, plus the following*: - TV Advertising (commercial)	All those listed for *The Beast*, plus: - Hidden messages embedded in commercials - Glyphs hidden in print newspapers	Maintain existing (and recruit new) viewers of *Lost* TV series between seasons
Cathy's Book Series (2006-2009)	- Novelist/Creative Writers - Graphic designers - Web designers	- The book was the primary narrative delivery platform, but included most media noted above, along with: - Physical artifacts contained in a pocket within the covers of the print book (business cards, copies of photos, etc.)	The goal for most of the challenges was to unravel the mystery behind Cathy's boyfriend (without getting her killed), and involved following a trail of clues embedded in websites, emails, phone messages, etc.	Experimentation with narrative formats: "Cathy's Book is a first attempt at bridging [the] gap"[7] between one-time, collective ARG play and re-playable, more individual experiences.
World Without Oil "WWO" (2007) ~1700 players	- Producer - Creative Writers - Game/Puzzle designers - Live Actors - Community Lead/Liaison	- Websites/Blogs (player-created and in-game character-created) - Email - Voice-mail (player-created, then converted to podcasts)	- Primary challenge was for players to share stories, in any media they preferred, about how they were coping during the oil crisis that formed the fictional backdrop for the ARG	"Create collaborative and imaginative play on a major social issue"[8] (Global oil shock)
ARGOSI (2008-2009)	- University professors and academic librarians from the fields of education and learning-based game design - Web programmers - Graphic artists	- Websites/Blog - Email - In-game community site - Physical Artifacts (Map fragments) - Live events - Video	- Map fragments were revealed to players in response to riddles and puzzles they solved - Morse code - Library searches (similar to Dewey Decimal classification)	Introduce new college students (undergraduates) to university life, to include practicing information literacy skills while learning about their school's neighboring community

[7] Sean Stewart, co-author of Cathy's Book. Personal interview, Dec 17, 2010.

[8] Mission of WWO according to Ken Ecklund, the ARG's Creative Director/Producer. http://www.writerguy.com/game-ed/wwo/wwo.htm (accessed Dec 2011)

ARG Example	Diversity/Distribution of System Components			Purpose
	People (Focus is on Designers)	**Media/Platforms**	**Challenges (clues, puzzles)**	
Black Cloud (2008) ~40 high school students	- University graduate student (eduation)/high school teacher - University graduate student (bio-engineering) - University Professor (Game studies)	- Websites - Live Events - Customized air quality sensor used by the players ("pufftron") - Maps - Videos - Micro-blogging tool (Twitter)	- Figure out "pufftron" sensors to gain access to video and website needed to continue game - Scavenger Hunts - Create videos for themselves and community about pollution issues - Create "seed bombs" for community areas in need of revitalization	University Research Project with goal to design an ARG that introduces high school students to climate change issues and engages them in environmental science-based challenges.
Personal Effects: Dark Art "PE:DA" (2009)	- Novelist/Creative Writers - Graphic designers - Web designers	- The book was the primary narrative delivery platform - Physical artifacts contained in a pocket within the covers of the print book (business cards, copies of photos, etc.) - Websites/Blogs	Like the Cathy's Book series, the endgame for PE:DA challenges was to unravel the mystery behind the protagonist, Zach's, disturbed patient, Martin Grace - Clues embedded in "evidence pack" that accompanies print book (e.g., images that can be folded to reveal a hidden message)	Experimentation with narrative formats: transmedia story that moves beyond pages of printed text (cf. Cathy's Book)
Urgent Evoke (2010) ~20,000 players	- Creative Writers - Graphic designers - Game/Puzzle designers - Live Actors - Community Liaisons/leads	- Community Website (password-protected) - Websites/search engines for information-gathering - Videos - Serialized Graphic Novel - Mobile phone version	Missions – Individual and community-based challenges to tackle and help solve global social issues (e.g., empowering women) Quests – Personal challenges for players to "write their origin story" (how they became super-heroes).	"Empower young people all over the world…to [actively tackle] the world's most urgent problems – poverty, hunger," etc. (McGonigal, 2011, pp. 333-334).

Table 2.1 Sample of ARGs classified as systems of diverse components. (3 of 3 pages)

ongoing exchanges between the design team and players as the story unfolds and puzzles are solved.

During *The Beast*, its designers earned the nickname, "*puppetmasters*" [9] (PMs), by players because they were the hidden entities "working behind the curtain" to direct the game (McGonigal, 2007). Ostensibly, *The Beast's* design team controlled the narrative and players' interactions with it. However, ARG design does not end when game-play starts. Players' actions can continually affect story outcomes. Puppetmasters may design, create, and manage the multiple media and puzzles, but once the game goes "live," they must be capable of dynamically modifying and remixing any pre-planned narrative sketches in near real-time response to player input. As described by the *The Beast* puppetmasters during a post-game chat session celebration with players: "*You compelled us to make new sites and fix inconsistencies; when we accidentally used stock photos of the same woman in two different places, you noticed it immediately and spurred us to write one of our favorite storylines to 'explain' the mystery. You drove us to literally double the amount of content we had meant to provide. In short, you were* ***our*** *Puppetmasters*" (Szulborski, 2005, p. 99).

Throughout an ARG, both players and designers participate in a creative dialogue, collaboratively tinkering with plot twists as well as communication mechanisms. Their in-game symbiosis is evident in the following comments made by one of *The Beast's* players, a co-evolutionary complement to the puppetmasters' perspective: "*As we got better and better at solving their puzzles, they had to come up*

[9] Because the term, *puppetmaster (PM)*, is synonymous with ARG *designer*, I use the terms interchangeably throughout the rest of this dissertation.

with harder puzzles. They were responding to stuff we were saying or doing. …There was one point that we found things in their source code that they didn't intend to be there. And they had to write some story to cover this. They were writing just a little ahead of the players" (Jenkins, 2006, p. 125). The most widely published accounts of the dynamics of this relationship originated from *The Beast* and *I Love Bees*. However, *MetaCortechs'* designer Jeff Myers may have summarized it best during a post-game chat session with players: "*An ARG is written by multiple authors, on* ***BOTH*** *sides of the curtain*."

ARG designers must also be willing to adjust the game challenges they present. If players fail to decipher a puzzle or complete a game challenge, or if they miss a hidden narrative thread, designers must respond with additional clues, or find ways to reveal the solution within the narrative (Martin et al., 2006). The dynamic interplay between players and designers has implications in terms of learning and participatory culture, and will be discussed in more detail in section *2.4.2*. The point is that designers must not only respond to player feedback, but also accommodate multiple player backgrounds and skill levels. Reciprocally, players often learn about interactive design processes and strategies as they uncover and reassemble the story.

Although ARG designers employ a variety of different media formats in myriad ways to build their interactive story-worlds, every designer pays close attention to one factor present in all narrative formats: time. Determining *when* to deliver certain story or puzzle installments, not just *where* to distribute them– is another ARG design factor that falls under co-evolution. Jenkins (2011) relates timing considerations in ARGs to the evolution of television: from episodic (relatively self-

contained plot snapshots contained within a single episode of a particular show), to more serialized structures (a larger mythology within which episodes might function as chapters). Most ARGs to date (2001-2011) have employed some form of regular plot/puzzle update sequence as a structural overlay to more ad hoc, dynamic updates released in response to player activity. Although designers of *The Beast* began with the hope that updates would be released in response to player activity, they quickly shifted to a more regular update schedule – especially after the first few days, when players proved their mettle by solving most of the ARG's initial puzzles in a matter of days rather than the weeks the designers had planned for (J. Y. Kim et al., 2008a; Stewart, n.d.). Ultimately, *The Beast* design team released a new update every Wednesday, over a 3-month period. The designers of *Urgent Evoke* followed the same weekly format to release graphic novel installments and new player missions, with 10 total story beats and missions distributed over its 10-week run. *World Without Oil* (*WWO*) puppetmasters published daily updates over its 32-day run, with each day real-time simulating one week in-game. That is, although it was played in only 32 days, the narrative reflected 32 weeks of an oil crisis. *MetaCortechs* designers chose to update twice a week (Wednesdays and Saturdays) over 2 months. Today, pre-planned delivery of "story beats" is a standard approach for most puppetmasters. Deciding exactly how to implement such a schedule so that it maximizes co-evolution benefits for both puppetmaster and player still requires careful thought. Brooke Thompson, a player-turned-designer, wrote the following about the decision process she and her fellow *MetaCortechs* designers went through before settling on a final sequencing plan:

> *This was actually a pretty difficult decision for us. There are so many options: the formal 'Update Tuesday!' sort of schedule set by* The Beast*, the looser 'certain sites on certain days and extra stuff whenever' that* LockJaw *followed, or the very loose & always on 'whatever, whenever' schedule were all rather vigorously debated. In the end, the more formal 'twice a week, Wed & Saturday' plan was decided upon. … The deciding factor, in my eyes, was that the formal updates, while losing some of the realism, provides some 'downtime' for the players to create player resources, spec [speculate], and a general sense of community that comes with fun off topic banter"* (Aiken et al., n.d.).

Here, the gaps between narrative updates allow players to collaborative reflect and respond as they make sense of what has transpired and hypothesize about what may come. Likewise, regular sequencing supports designers as they monitor and synthesize player reactions in preparation for the "next installment." In short, players and puppetmasters co-evolve. Figure 2.3 represents the overall distribution of story elements, along with a general timeline, laid out by *MetaCortechs* designers. Note that time (weekly installments), space (Internet/IP address references), and theme (plot, or "episode" titles) are all specified visually.

2.3.4 Keystone Species

Keystone species are those whose presence is essential to the survival of the ecology itself. As a biological analogy, Nardi and O'Day (1999) cite the Indiana sand dunes, where the long roots of a particular species of grass (marram grass) prevent the sands from shifting with the winds of Lake Michigan, and help maintain the various species that live in and around the dunes. In ARGs, there are also keystone species whose characteristics ensure both designers and players flourish as they progress from launch to endgame. Based on an analysis of existing ARGs, I have identified five types of keystone species in ARGs that ensure players become and remain engaged. These five types of keystone species can be divided into two categories:

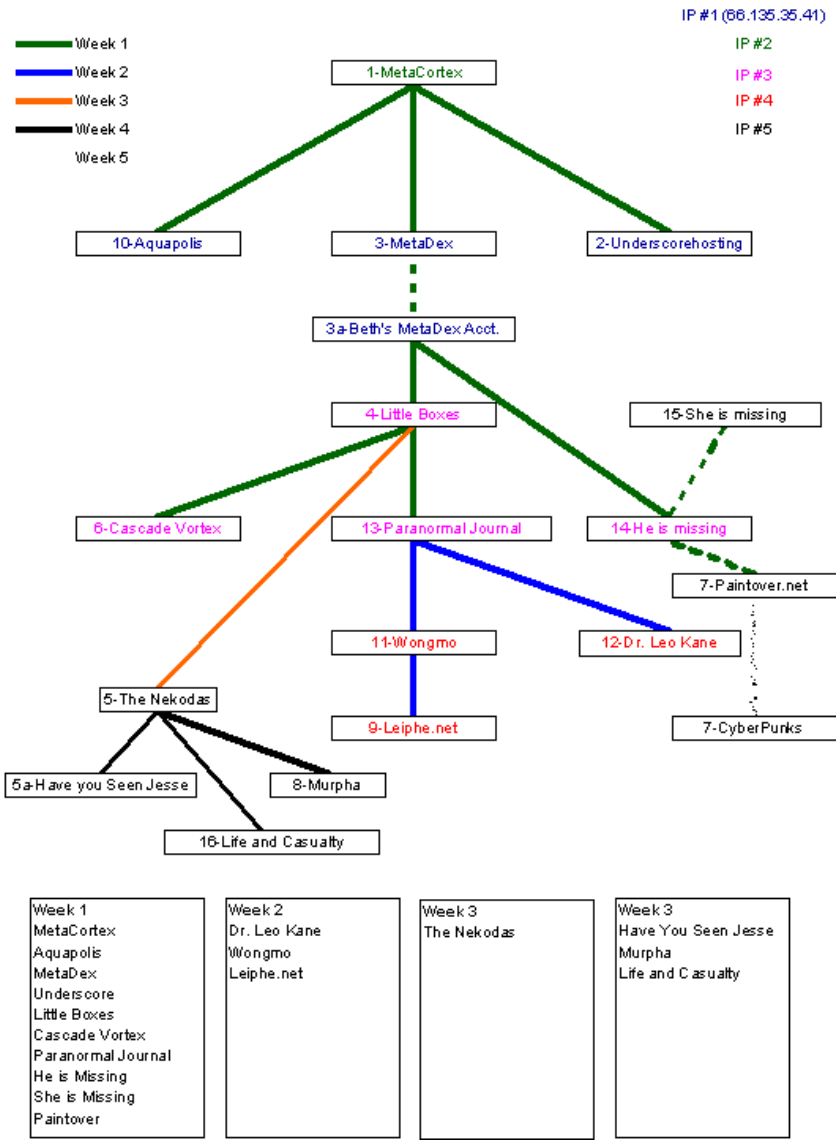


Figure 2.3: Sample design flowchart used by *MetaCortechs* (*Project MU*) Puppetmasters (Dena, 2008b).

- *Narrative-Centric, defined pre-game*. These roles include characters who are integrated into the narrative pre-game and whose social roles remain distinct from players throughout gameplay. Three social roles fall within this category:
  - The "*Protagonist-by-Proxy*", a character who is part of the overall narrative but works as a close ally and informant to the player community;

- The "*Protagonist-Mentor*" who acts as the ARG's help system and authority figure, often directing the players to complete specific missions and offering training or advice that enables them to do so; and
- The "*Antagonist*" (whether an individual "villain" or organization), that can serve as a primary source of conflict to engage potential players to participate and existing players to become more invested in helping the protagonists.

- *Gameplay-Centric, emerging during the game, post-launch*. Gameplay-centric roles can either be explicitly designed pre-game to be enacted once the ARG launches, or can emerge organically, as players take on community-stewarding responsibilities themselves. These key social roles may be established and assigned pre-game; however, little narrative content or player interaction for them is typically developed pre-game. These roles are activated for engagement after the game is launched. Two social roles fall within this category:
  - *Community Conduits*, who are responsible for dynamically reporting player activity to designers; and
  - *Planted or Proxy Players,* who may be introduced as incidental characters within the narrative, but whose primary roles are to interact dynamically with the player community as insiders. Planted Players can act as *Mentors* to players, welcoming and orienting new players, encouraging players individually to sustain participation, and providing feedback to ARG Community Conduits throughout the game.

2.3.4.1 Narrative-centric: Protagonist by Proxy

The "protagonist by proxy" keystone species is a staple interactive dynamic in ARGs. Novelist/screenwriter/transmedia author, J.C. Hutchins, coined the phrase to

evoke the ways in which ARG players function as "both passenger and driver of the narrative" (M. Anderson, 2008). The "protagonist by proxy" is a character who seems to discover the story in tandem with the players. During game-play, the player is presented with the same artifacts and information – such as URLs, copies of documents, photographs, email addresses, or phone numbers – as an in-game protagonist. Players have the chance to unearth secrets that this character may not have, but needs, and s/he has the means to communicate new information to the players. The protagonist-by-proxy often asks players for help in solving some problem that is initially perplexing, but increasingly threatening.

For example, in *ILB*, the web-master of the site asked players for help in getting rid of what looked like a hacking program that was breaking her site. In *ARGOSI*, a college student named Viola asks for help in uncovering the mystery of a letter that she found in her grandmother's attic. From an information literacy perspective, the protagonist-by-proxy often models productive information-seeking and problem-solving behaviors that the players can emulate. In *Personal Effects: Dark Art* (*PE:DA*), for example, the in-game protagonist Zach enlists the information search and retrieval skills of Rachael, his girlfriend, who is also a "fact-checker" for the New York Journal-Ledger. Similarly, in the *Cathy's Book* transmedia series for young adult readers, the lead protagonist, Cathy, has a best friend, Emma, who models expert information search and retrieval skills, similar to *PE:DA*'s Rachael for players to emulate.

Players often see the in-game protagonists as people "just like them," and are motivated to regard them as both mentors and investigative partners. At times, the in-

game protagonist not only seems like a partner in the player community, s/he actually breaks into the "real-world" of the players. The actress who portrayed Rachel Blake, the in-game protagonist in the Lost Experience, participated as an audience member in Comic-Con 2006. During a panel with the producers of the Lost TV show, she took an active part in the question and answer period, causing a scene that drew cheers from other audience members when she accused the producers of hiding information about the Hanso Foundation, a fictional organization within the *Lost Experience* narrative (Lostpedia, n.d.).

2.3.4.2 Narrative-centric: Protagonist-Mentor

Just as videogame narratives benefit from including characters who act as the gameplay "help system" (Isbister, 2006) or game guide, ARGs designers implement protagonist-mentors. These narrative-centric social roles support player sense-making from a more authoritative vantage point than the protagonist-by-proxy. As a player ally who is uncovering information alongside the player, the protagonist-by-proxy is not able to provide higher level, omniscient information about the game narrative, and cannot offer training guidance or advice on game challenges. A protagonist-mentor offers a character-driven device that authentically fulfills this role. This role has been most evident in ARGs created with learning goals in mind. For example, in *ARGOSI*, the protagonist-by-proxy, Viola, needed help to navigate the university library databases that would help her solve the map-based puzzles that she encountered throughout the game (N. Whitton, personal interview, Jan 2011). Because the ARG was also promoting information literacy activities for new university freshmen, the *ARGOSI* design team wanted to establish that there was an authoritative, credible educational resource to support gameplay (N.Whitton, personal interview, Jan 2011).

The protagonist-mentor, Percy Root, who was a fictional librarian at the local university, was created to fulfill this role. His blog posts were publicized at the beginning of the ARG, and provided links to Viola's main website as well as pointers to university databases and helpful tips about using them.

2.3.4.3 Gameplay-Centric: Community Conduits

Because of the ways in which ARGs distribute content, a key problem for both designers and players is keeping track of what is being found, who is finding it, what they are doing with it, and how it fits into the overall story. For designers, the question is: how do we connect our players to the distributed narrative content, and with each other? For players, the question is: how do we collectively keep track of what we have, what do we think about how it fits into this mystery we are unraveling, and how do we make sure we have – or can summon – all the skill sets we need? The solution on both sides has been a social one: make sure someone is watching, responding to, and capturing or preserving the community interactions. This role is best described as a *conduit* that ensures interaction data about gameplay is being shared effectively and efficiently among ARG designers and players, and among players themselves. The role of the community conduit has been fulfilled by key individuals, known variously as the Community Lead (in *ILB*), the Participation Architect (in *WWO*), the Community Liaison (in *WWO*), or Moderator (in *The Beast*).

During *The Beast*, the core puppetmaster team shared the responsibility of monitoring and responding to any and all player reactions [S. Stewart, personal interview, Dec 17, 2010]. For their next ARG venture, *I Love Bees (ILB)*, the same design team felt the community-monitoring task was so important that they recruited

a "Community Lead."[10] The *ILB* Community Lead was responsible for checking "every known source of information written about the game, including discussion groups, …mainstream media and blogs" (J. Y. Kim et al., 2008a, p. 39). The community lead would also file a daily report that the design team would use to make "instant story updates and adjustments as needed" (J. Y. Kim et al., 2008a, p. 40). Since then, a Community Lead or Liaison has been a standard member of the ARG design team. *World Without Oil* (*WWO*) listed three Community Liaisons and one "Participation Architect" in its project team credits (Eklund, 2007). Jane McGonigal, *WWO's* Participation Architect, called it "a fancy way of saying my job was to help make sure every single player found a way to contribute meaningfully to the collaborative effort" of the game (McGonigal, 2011, p. 305). Fancy name or not, establishing a formal community monitor and conduit has become a primary means for ARG design teams to help engage and sustain player participation. It is important to note that the support functions that community conduits provide are not unique to ARGs – other studies have identified individuals who serve similar roles, such as founders/leaders (Kraut & Fiore, 2014a), mediators (Okamura, Orlikowski, Fujimoto, & Yates, 1994), and elders, or mentors (A. J. Kim, 2006).

Player communities have devised their own equivalent forms of community support. These players are typically more active players who establish themselves as forum or chat room moderators. They help organize content and categories on community wikis or similar game-based repositories, and tend to "bring new players

[10] Jane McGonigal was the *ILB* Community Lead. Then a doctoral student at the University of California, Berkeley, McGonigal has since led or participated in the design and implementation of several award-winning ARGs, including *World Without Oil, Superstruct,* and *Urgent Evoke*.

and lurkers into the community through fun and welcoming discussion" (A. Martin et al., 2006, p. 46). Community leads become instrumental to the community in terms of keeping track of information or recruiting new participants with skills the existing community might be lacking (Dena, 2008a; A. Martin et al., 2006). For example, player leads would make public appeals to find experts who could decode the esoteric lute tablatures in *The Beast* (like those shown in **Figure 2.2**), or they would rally the community to publish an actual printed book in order to gain access to a secret library in *Perplex City* (Bonsignore, Hansen, Kraus, & Ruppel, 2012). Several early player community leads moved on to become ARG designers themselves, while others established and maintain prominent ARG gaming and critique communities (e.g., Unfiction, ARGnet, and ARGology) (A. Martin et al., 2006). Community liaisons, whether on design teams or in player communities, have also become key figures in the preservation and evolution of ARGs as a genre.

2.3.4.3 Gameplay-Centric: Planted Players

In addition to appointing design team members to act as community leads during game play, some ARG designers have also established cadres of "super-players" or mentors within the player community to support players' efforts to participate by pointing them toward clues or resources and providing encouragement when they are struggling. These "planted players" may be related to the ARG narrative, but are defined more as incidental characters rather than central personae like the Protagonist-by-Proxy or Protagonist-Mentor. Consequently, they function very much like players themselves. In particular, *WWO* and *Urgent Evoke* made use of planted players to promote player participation.

From a narrative perspective, *WWO*'s "Eight to Save Our Country" (or 8TSOC) was the group of average citizens who discovered the impending oil crisis that would become the central theme underpinning all player activity (Eklund, 2008). Ostensibly, these eight individuals met while stranded together at an airport, where each received the same warning that a shortage would strike in six months. (In reality, the 8TSOC characters were written and played by the WWO puppetmasters (Eklund, 2007)). The 8TSOC's background also gave players a narrative-based rationale for posting and monitoring their contributions to a central community site. In most ARGs prior to *WWO*, players established their own ad hoc forums and discussion groups to share information and piece fragmented story elements back together. In *WWO*, the 8TSOC told potential players that they had established an official community site to track the crisis, collect and aggregate responses and strategies for dealing with it from around the country—and the world. This core group of planted players recruited new players through their publicity of the community site and used the site to highlight "featured" players' contributions. Furthermore, by creating a central hub for player participation and publicity, the *WWO* design team also ensured that core content of crowd-sourced story lived on, even after the live game had ended – a fate that few ARGs to date have enjoyed. The content created for many ARGs, whether by design team or by player communities, disappears soon after endgame (Ruppel, 2009).

Urgent Evoke extended the notion of "planted players" even further into their actual player community. During the ramp-up to their ARG's launch date, the *Urgent Evoke* puppetmasters recruited "Mentors." Evoke Mentors were neither members of the Evoke design team nor characters from the weekly graphic novel narrative

installments; rather, they were players who volunteered to publicly champion small numbers of their fellow players throughout the course of the game (Alchemy, 2010b). In most cases, Evoke mentors would welcome new players as they joined the game and provide peer review via comments on individual player mission and quest updates.

Table 2.2 outlines the ways in which ARGs from the 2001-2010 representative sample implemented the keystone species, *Protagonist-by-Proxy* and *Protagonist-Mentor.* Table 2.3 summarizes the ways that the *Community Conduit* roles were developed for these ARGs (whether they were created explicitly by the design team or it emerged dynamically from the player community). Where applicable, the *Planted Player* role is also specified for these ARGs in Table 2.3. These keystone species hold implications for use in the design and play of ARGs for learning. The Protagonist-by-Proxy could be designed to model target literacy practices as well as motivate players on a peer-to-peer level. Educators (whether in informal or formal education contexts) or older students could assume roles as *Community Leads* or mentors and encourage more hesitant players.

2.3.5 Locality

For Nardi and O'Day, the locality of an information ecology helps us define its components not only by what they are called, but by where they are used, who uses them, and how they are used. For example, a computer in a small business might be used primarily as a budget and payroll system. This computer is used by human resource personnel, maintained by system administrators, and networked to other

Table 2.2: Highlighting the Narrative-Centric Keystone Species in the representative ARG sample

ARG Example	Narrative-Centric: Protagonist-by-Proxy; Protagonist-Mentor
The Beast (2001)	**Protagonist-by-Proxy**: Laia Salla (grand-daughter of Jeanine Salla, "sentient machine therapist" who provided first "rabbit-hole" into the story). Laia posts a memorial message online questioning the "accidental" death of one of the ARG's main characters.
MetaCortechs Project MU (2003)	**Protagonist-by-Proxy:** Beth (employee at Metacortex company). Tries to unravel the mystery behind the disappearance of her company's former CEO (via emails that players gain access to after solving an early puzzle).
I Love Bees "ILB" (2004)	**Protagonist-by-Proxy:** Dana, webmaster for the Ilovebees.com site (also niece of the site owner). Asks for help from players when the site is hacked, and exchanges 100+ emails with them throughout game before "disappearing."
Perplex City (2005-2007)	**Protagonist-by-Proxy:** Kurt McAllister and his daughters, Violet and Scarlett, citizens of Perplex City who are trying to discover clues there while players on Earth search for a valuable Perplexian artifact (the Receda Cube).
Lost Experience (2006)	**Protagonist-by-Proxy:** Rachel Blake (aka Persephone), a gifted 25 year old woman who investigates the Hanso Foundation, a key organization in the *Lost* TV series.
Cathy's Book Series (2006-2009)	**Protagonist-by-Proxy:** Cathy (book protagonist), 18-year old girl with mysterious boyfriend. Players follow along with Cathy and her best friend Emma. **Protagonist-Mentor:** Emma models effective information search techniques for readers/players as they search for answers.
World Without Oil "WWO" (2007)	**Protagonist-by-Proxy/Protagonist-Mentors** (who also acted as Gameplay-Centric "Planted Players"): The "Eight To Save Our Country," or 8TSOC, were eight fictional characters who were warned of the impending oil shock when they were stranded in an airport about six months before the start of the game. They told players that they had collectively launched the WWO website as a mechanism for collecting and curating global responses to the crisis.
ARGOSI (2008-2009)	**Protagonist-by-Proxy:** Viola (college student like players), who finds cryptic letters in grandmother's attic and asks for help to solve mystery. **Protagonist-mentor:** Percy Root, a fictional librarian at one of the university's that participated in ARGOSI. Percy's blog posts provided links to Viola's website, along with pointers to university databases and helpful tips for using them.
Black Cloud (2008)	**Protagonist-by-Proxy:** Cloudy McPufferson, an anthropomorphized "cloud" who worked with student-players to monitor air quality/improve local environment
Personal Effects: Dark Art "PE:DA" (2009)	**Protagonist-by-Proxy:** Zach Taylor, trying to determine if his patient, an alleged serial murderer, is sane (or not). **Protagonist-Mentor**: Rachael (Zach's girlfriend, *PixelVixen707* online). Like Emma from Cathy's book, Rachael is shown modeling effective information search techniques for readers/players.
Evoke (2010)	**Protagonist-by-Proxy:** Various characters from the weekly *Evoke* graphic novel updates. **Protagonist-Mentor:** Alchemy introduced players to the game. His blogs contained hints to players about how best to participate.

Table 2.3 Unique examples of Keystone Species that emerged and evolved during gameplay

ARG Example	Game-Centric: Highlighted Community Conduit and Planted Player roles
The Beast (2001)	- Player-initiated: Community moderators (most active: *Cloudmakers*). The ARGnet and Unfiction social media sites for ARGs/transmedia grew from this early player community.
MetaCortechs Project MU (2003)	- Player-initiated: The player community published a print and online MetaCortechs guidebook, *Mu*, to capture and preserve their experience ("Project MU archives," 2004).
I Love Bees "ILB" (2004)	- Designer-initiated: First officially designated "Community Lead" on an ARG design staff - Player-initiated: RG community sites established on ARGNet and Unfiction
Perplex City (2005-2007)	- Player-initiated: ARG community sites (ARGNet and Unfiction) and a Perplex City wiki. Like Metacortechs, the players published a book. Unlike the memoir that the MetaCortechs player community created, the Perplex City book, *Tales from the Third Planet*, was a compilation of fan-fiction by that extended the Perplex City universe (Centipede, Scott, & SledgeCallier, 2005)
Lost Experience (2006)	- Player-initiated: Player community produced a player guide, the *Lostpedia* ("The Lost Experience (TLE)," 2006).
Cathy's Book Series (2006-2009)	- Designer-initiated: Established a formal Player community forum, "Double-Talk Wireless", where fans could discuss the book, share spoilers and codes. - Player-initiated: ARG community sites, ARGNet and Unfiction
World Without Oil "WWO" (2007)	- Community Liaisons, Participation Architect - Planted Players: The "Eight to Save the World" (8TSOC)
Black Cloud (2008)	As a classroom-based ARG, Black Cloud designers and players interacted primarily through face-to-face interaction with the design team and characters.

computers in the business that could affect its performance. Similarly, a computer in a library would be a media resource and reference tool (or card catalog), used by students, maintained by librarians and reference staff, and connected to related teaching materials. Technologies are not the only component in an information ecology that is affected by locality. Consider that a teacher or librarian in a formal education setting (e.g., science class) may be viewed differently than a teacher or librarian in an informal education setting (e.g., after-school robotics club).

The concept of locality helps bound the components of an information ecology structurally (where are they used) and in terms of their relationships to other system components (who uses them, and how are they used). Locality in ARGs can be defined on several levels. At a high level, an ARG can be classified according to

its overarching purpose/mission (see Table 2.1, *Purpose* column) – such as social causes, new media expressions, or marketing. Some ARGs may be designed originally for one purpose/context, but be used in other contexts. For example, *WWO* started as a social experiment (how will people respond to a debilitating, global oil shortage?). When many educators expressed an interest in modifying its formats for use in education, teaching resources were added to its archives, which have been implemented in environmental science and social studies classrooms. The primary locality focus for my dissertation is on ARGs in educational contexts.

Locality in ARGs can be subdivided further in terms of in-game, story world context and the out-of-game, player-maintained community context. The local context for the player includes community-based tools that support their efforts to make sense of the story. Players often maintain archives of all the story fragments they have uncovered using collaboratively editable content-management tools such as wikis. They also establish community forums to share theories and speculations about certain plot elements and in-game characters, to catalog puzzle-solving resources, or document puzzle solutions.

Unsurprisingly, design decisions for the in-game, story world are influenced most by its setting or timeframe, and the roles that characters assume. In general, because many ARGs are set in the present or near future, the communication technologies used by in-game characters are very similar to those used by player community. In-game characters may use blogs, emails, and chat, just as the players use these communication tools to share information as they make sense of the game. If the plot includes historic elements, such as messages from characters in the 19th

century, additional media formats might be added (e.g., aged documents), along with similarly matched game challenges (morse code, vigenère ciphers, etc.).

Just as fiction writers judiciously employ various narrative devices to best advance their plot or enrich their characters (e.g., dialogue, multiple narrators exposing different points of view, ellipsis), ARG designers strive to ensure that each story fragment is embedded in a medium most appropriate for its message (e.g., phone text messages during a time-sensitive live event, blog post explaining the feelings of a key character, email sent with a phone number a player is asked to call). In an interview on ARG design, David Varela (*Perplex City* writer/puppetmaster) noted, "different media have different speeds. You may want something that's going to have the action moving really fast, so use twitter. Or, if it's interactive, maybe you do a live chat" (personal interview, Oct 14, 2011).

Decisions about the specific types of media used by specific in-game characters to reveal or point to story fragments are also based on the character. For example, an artist might reveal a plot point through a visual puzzle or artifact (e.g., Zach in *PE:DA*, or Cathy in *Cathy's Book*). Likewise, game-based challenges presented to the players (logic puzzles, encoded messages, etc.) are appropriate for the character or context in which they are used. During a post-game session with players, the *Metacortechs* designers relayed the following design criteria when asked whether they should have deployed more steganographic puzzles: "It's a challenge to make the puzzles fit the characters… Did the puzzle make sense in the context of the character who offered it up, and in the context of the storyline it was intended to serve? For example, it wouldn't make any sense for Beth, who was not a hacker, to

make up a puzzle based on hacking; nor would it make sense for MLO to create a puzzle just for the heck of it and place it in his 'Dex[11], which he had every expectation was intended to be private for his eyes only. Most characters had no NEED to resort to stegging [steganography] to get their points across in-game" ("Project Mu: FAQ," n.d.). Table 2.3 provides a snapshot of the local contexts of past ARGs in terms of in-game, story world (Time/Setting focus) and out-of-game, player community (sense-making resources/tools).

2.4. What current research says about: Interaction Design, Transmedia, and Literacy

In this section, I survey research in human-computer interaction, transmedia and literacy/learning models to lay the groundwork for crafting responses to the questions that guide my ARG design study. First, I place ARGs within the field of Interaction Design, in relation to the information ecology properties, *system* and *diversity*. As an interactive system, the ARG's user experience goal is to support participatory storytelling across media, so transmedia storytelling is also defined under this section. Comparisons to digital games are also made. The goal of section *2.4.1* is to lay the groundwork for the development of a design matrix outlining the affordances, constraints, and key interaction features of the range of media/platforms available to ARG designers ("*ARGs through the lens of interaction design*").

Next I review existing research on 21st century and new media literacy frameworks. I compare these curricular design guidelines with game-based learning models and existing research on player participation in ARGs to illuminate possible design patterns and mechanisms for ARGs that support 21st century literacy goals

[11] Short for *Metadex*, which was a new type of web-based information system created by the in-game company, *Metacortex*. Somewhat analogous to a rolodex.

Table 2.3 Comparison of in-game (Story World) and out-of-game localities within each ARG in the sample. (1 of 3 pages)

ARG Example	Locality	
	Story World (in-game)	**Player resources/interpretations (out-of-game)**
The Beast (2001)	**Time**: the future, same timeframe as the A.I. movie (2142). World is populated by humans, "post-humans (human/machine cyborg mix), and "sentient machines."	Players share data and discuss the story world on out-of-game community sites/wikis/forums. Some signal "spoiler alerts" on their out-of-game sites, in case newcomers want to solve puzzles/challenges on their own. The most well known resources are *cloudmakers.org* and the *Cloudmakers* Yahoo® group, an encyclopedic account of the players' interpretations of, and experiences during the game.
MetaCortechs (2003)	**Time**: the present/near-future, same timeframe as the Matrix movie series.	Players share data and discuss the story world on out-of-game community sites/wikis/forums. Some signal "spoiler alerts" on their out-of-game sites, in case newcomers want to solve puzzles/challenges on their own. Players create a print and online book chronicling their experiences and interpretations about the ARG.
I Love Bees "ILB" (2004)	**Time**: the present. AI program from the Halo Xbox® game universe crash-lands on Earth and players help the AI program rebuild itself.	Players share data and discuss the story world on out-of-game community sites/wikis/forums. Some signal "spoiler alerts" on their out-of-game sites, in case newcomers want to solve puzzles/challenges on their own.
Perplex City (2005-2007)	**Time**: the present. Story world is presented in parallel: Earth and a parallel world like Earth called Perplex City communicate through various hidden websites/Earthly communications platforms.	Players share data and discuss the story world on out-of-game community sites/wikis/forums. Some signal "spoiler alerts" on their out-of-game sites, in case newcomers want to solve puzzles/challenges on their own. Players create a collaboratively authored print book to in order to gain access to the Perplex City library. While created in-game, the print book is available as an out-of-game, post-game artifact available as a "stand-alone" work of fiction.

ARG Example	Locality	
	Story World (in-game)	**Player resources/interpretations (out-of-game)**
Lost Experience (2006)	**Time**: the present, includes all fictional organizations and characters from the *Lost* TV series.	Players share data and discuss the story world on out-of-game community sites/wikis/forums. Some signal "spoiler alerts" on their out-of-game sites, in case newcomers want to solve puzzles/challenges on their own. The most well known resource is *Lostpedia*, an encyclopedic account of the players' interpretations of the ARG and TV series.
Cathy's Book Series (2006-2009)	**Time**: the present, various locations in the US.	Reader-players experience story through both the print book and online sites. Some readers never go beyond the print book. Others find the sites independently, with no community interaction. Still others share data and discuss the story world on out-of-game community sites/wikis/forums (e.g., Unfiction, ARGnet).
World Without Oil *"WWO"* (2007)	**Time**: the present, in which world is reacting to an extreme, emergency shortage global oil resources	Players interact in the same world as in-game story world, maintaining no real distinction between in-game context and out-of-game context. Most players' personal stories were accessible from the in-game community site. Post-game, educators approached the design team about developing curricular materials that would support re-playing the ARG in classrooms. This led to the development of online curricular resource packs containing suggested lesson plans/learning objectives for each week's mission.
ARGOSI (2008-2009)	**Time**: the present, with references to a fictional past and ability to communicate with the past.	Student-players interact in the same world as the in-game story world, primarily through the in-game community site (access granted by in-game protagonist).
Black Cloud (2008)	**Time**: the present, in a typical urban neighborhood in southern California, US.	Student-players interact in the same world as in-game story world, maintaining no real distinction between in-game context and out-of-game context.

ARG Example	Locality	
	Story World (in-game)	**Player resources/interpretations (out-of-game)**
Personal Effects: Dark Art "PE:DA" (2009)	**Time**: the present, in New York, US.	Reader-players experience story through both the print book and online sites. Some readers never go beyond the print book. Others find the sites independently, with no community interaction. Still others share data and discuss the story world on out-of-game community sites/wikis/forums (e.g., Unfiction, ARGnet).
Evoke (2010)	**Time**: the present, in which the EVOKE secret agents are being called upon to respond to specific global issues (poverty, world hunger, oppression of women, disaster recovery, etc)	Players interact in the same world as in-game story world, maintaining no real distinction between in-game context and out-of-game context. Players also created an external community wiki with suggested lesson plans/learning objectives for each week's mission. Toward the end of the game, many players link to what would become post-game sites that champion their own entrepreneurial proposals, submitted to the World Bank Institute as their final missions. Note: Both Evoke designers and players do not consider these post-game sites "out-of-game," since the game's focus is on "real-world" problems. The only distinction is time: These sites continue after the first iteration of *Evoke* ("Season 1").

Table 2.3 Comparison of in-game (Story World) and out-of-game localities within each ARG in the sample. (3 of 3 pages)

("*ARGs through the lens of curricular design*"). The parallels between game/ARG design and designs for learning also reflect the information ecology properties, *co-evolution*, *keystone species* and *locality*. I include definitions of concepts such as transmedia and participatory culture, highlighting each concept's relevance to my investigation into ARG designs in learning contexts.

2.4.1. ARGs through the lens of Interaction Design

The media and platforms used to distribute an ARG's story, and the technologies used by players to make sense of it and share it are products of human-computer interaction (HCI) design. As an interactive storytelling experience, however, a major ARG design goal is to foreground the narrative, not the technologies. In this section, I situate transmedia storytelling and ARGs under the umbrella of HCI and interaction design. I also address the diffusion (or disappearance) of the screen-based "interface" in pervasive experiences like ARGs.

2.4.1.1. HCI, Interaction Design, Pervasive Computing

> *The most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it"* (Weiser, 1991, p. 94).

Where does ARG design fall within the realm of HCI design? Consider the working definition of HCI, published in 1992 and 1996 by members from the Computer-Human Interaction Special Interest Group of the Association for Computing Machinery (ACM SIGCHI): "Human-computer interaction is a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them" (Hewett et al., 1996, p. 5). The SIGCHI members first used this definition in an effort

to expand the scope of existing computer science curricula to include issues of interest to HCI practitioners, such as enhancing the everyday use/usability of computing systems, increasing the portability of individual systems, and ensuring the ubiquity of networked systems. Although the group stated that their specific focus was on the "*interaction* between one or more humans and one or more computational machines" (Hewett et al., 1996, p. 5), the notion of the computer as interface remained. This was in part because the SIGCHI's curricular design goal was to situate HCI within computer science education, despite their acknowledgement that HCI was/is an interdisciplinary field.

Less than a decade later, the definition of HCI was revised and expanded. The new definition reflects our understanding that conventional computers are not the only product of interest to designers who strive to support human communication. The "human-computer" modifier was dropped. Interaction Design (IxD) is about "designing interactive products to support the way people communicate and interact in their everyday and working lives" (J. Preece, Rogers, & Sharp, 2002, p. ix) – regardless of tools or technique. Indeed, the sub-title of Rogers, Sharp, and Preece's (2002) textbook is: "*Beyond* Human-Computer Interaction" (emphasis added). This perspective also places interaction design professionals who focus on more human-centered approaches, such as cognitive psychologists and social scientists, on a more equal footing with software engineers and computer scientists in the multidisciplinary field.

Broadly, based on their characteristic interactivity and integrated use of multiple technologies to support and enhance human communication, ARGs are HCI

systems, and ARG design falls within interaction design. To relate my study on ARGs to interaction design, I could simply rephrase the HCI and IxD definitions, as follows: "concerned with the design and implementation of interactive ARG experiences" and "supporting the way people communicate and interact while playing an ARG." This maintains the focus on human communication and interaction that is central to the field. As a designed, interactive system situated within our everyday lives; however, *where is the ARG interface?*

As noted in Chapter 1, ARG designers describe their interface as the everyday world, because ARGs "take the substance of everyday life and weave it into narratives that layer additional meaning, depth, and interaction upon the real world" (Martin et al., 2006, p. 6). Similarly, a decade before the *The Beast* was launched, HCI designer and Xerox PARC researcher, Mark Weiser, presented his vision of ubiquitous computing as technologies that "weave themselves into the fabric of everyday life until they are indistinguishable from it (Weiser, 1991, p. 94).[12] For Weiser, ubiquitous computing did not just refer to 'computers that can access a worldwide information network from anywhere' (the most common use of the phrase at the time). This usage still focused the attention on a single interface, the computer screen. Weiser preferred the phrase, "embodied virtuality" (1991, p.98), explaining it as a process by which computer-readable data might be seamlessly embedded in the physical world, effectively rendering the screen-based "interface" invisible. Ubiquitous computing, also known today as pervasive computing, are the phrases that persist today (Davies, 2012; Satyanarayanan, 2001). In pervasive computing, the

[12] Also quoted at the beginning of this section, p. 44.

interface is transparent, embedded within the very spaces and objects with which the user interacts (Satyanarayanan, 2001).

In the field of interaction design, ARGs can be placed within the category of pervasive computing or pervasive games (Montola, 2009; Nieuwdorp, 2005). A screen-based, or tangible hardware-based interface may be included in the pervasive game world, but the player does not engage with an ARG through one screen- or hardware-based interface alone. As an interactive system of interrelated components, the ARG interface can be traced through as many media and platforms that are used to build the story world and tell the story. *The storyline is the player's interface into an ARG.*

2.4.1.2. ARGs, Traditional Digital/Videogames, and the Magic Circle

If the story is the cornerstone for ARGs, why refer to them as games at all? One reason is that all ARGs are infused with the element of play.[13] Both designers and players tinker with the story, re-interpreting and possibly re-mixing it as its fragments are pieced together over time. In addition, ARG challenges themselves resemble the obstacles, levels, or conflicts inherent in more conventionally structured board and videogames. Once a player clears the ARG's game-based hurdles, her "level-up" reward is the discovery or receipt of a new story episode.

Thus far in my dissertation, ARGs have been defined by detailing the components that comprise the system overall (e.g., story fragments, collaboration among players). Definition by comparison is also useful. ARGs can be compared to traditional videogames using the descriptive components of Exposition, Interaction,

[13] *Play* is defined here not only in the dictionary sense, "to amuse oneself, as by taking part in a game or sport," (Guralnik, 1980). I also refer to *play* as it is applied in the study of digital games: "when [game] rules are combined in specific ways, they create forms of activity for players called 'play'" (Salen, 2008, p. 271).

and Game Challenges (Martin et al., 2006; Phillips, 2006). **Table 2.4** offers a brief overview of the expository, interactive, and challenge/puzzle-related features that distinguish ARGs from more established, traditional videogames.

Exposition deals with the way in which the game world is presented, and the contexts that motivate players to accept and follow through challenges. In many videogames, expository bits are non-interactive cut scenes that are served up on completion of a game level or challenge. For ARGs, uncovering or making sense of the story is the end-game goal. While most videogames immerse their players in a 3D virtual world, ARG storylines are anchored in the "real-world" – using print, everyday communications tools, real people, and social media.

Table 2.4: ARGs and Videogames: Comparison across interaction components

	Videogames	**ARGs**
Exposition	- Provides Context - Cut scenes with little interaction - Mostly virtual, digitally rendered world and single platform	- The story *is* the game (interface) - Anchored in "real" world, hybrid
Interaction	- Computational Rules - Controllers (mouse, joystick, pointing device)	- "Everyday" communications & media (Pervasive interface) - Malleable storyline - Conversation and Collaboration
Challenges	- Typically external to narrative content	- Embedded in story bits

In terms of interaction between player and game world, in videogames, players engage with computer-based characters and events that are driven by computational rules and AI. Their game play input is executed via controllers, like joysticks, or mouse and text input. In contrast, ARG players chat with in-game characters in real-time, either via phone, email, blog-post comments, or even in the physical world (A. Martin et al., 2006; Phillips, 2006). The story is malleable, because puppetmasters and players often influence the storyline in real-time. Players

converse with "live" characters and collaborate amongst themselves versus engaging in the comparatively deterministic rule-based interactions in videogames.

Both videogames and ARGs contain game challenges, puzzles, or missions that must be completed to advance the game. In more traditional games, the narrative may provide context and some motivation: if a player finishes a level, s/he gains the chance to watch a cut-scene that celebrates the achievement, and also sets the scene for the next set of challenges. However, the game-play is not seamlessly integrated with the narrative. In ARGs, story fragments are embedded into the game challenges and puzzles. Conversely, solved puzzles often point to the next chapter or installment of the narrative.

Although I have compared ARGs to their videogame counterparts, and have touched on the ARG "interface" in contrast to videogame interaction controlled by hardware like joysticks, I should also describe the notion of pervasive games in more detail. Most references to pervasive games start with a discussion of Dutch historian, Johan Huizinga, and his description of play and the world of a game as a "temporary world within the ordinary world, dedicated to the performance of an act apart" (Huizinga, 1950). Huizinga described the boundary between the "temporary world" of a game and the "ordinary world," or everyday life as the "magic circle" (Huizinga, 1950). Salen and Zimmerman (2003) revived Huizinga's concept of the magic circle, describing it as a "shorthand for the idea of a special place in time and space created by a game" (p. 5). In pervasive games like ARGs, the interface crosses the bounds the magic circle: "A pervasive game is a game that has one or more salient features that expand the contractual magic circle of play spatially, temporally, or socially"

(Montola et al., 2009, p. 12). From a pervasive computing, interaction design perspective, then, a study on ARG design should consider the ways in which the story interface crosses spatial boundaries (across systems like websites or phones), social boundaries (relatively large, collaborative player community), and temporal boundaries (longer than the typical "3-4 hour" game session). Finding ways to signal the boundaries of the magic circle, without breaking a players' immersion in story world, is also an important design issue. The goal is to enable TINAG's willing suspension of disbelief without blatant deception.

2.4.1.3. ARGs as Transmedia Storytelling Systems

The term transmedia, by itself, simply means "across media" (Jenkins, 2011). Transmedia storytelling is used most often across industry and academia to describe method of storytelling using multiple media formats, distributed across multiple platforms, with each work "making a distinctive and valuable contribution to the whole" story or experience overall (Jenkins, 2006, pp95-96). Fundamentally, the power of transmedia storytelling is not in the divergence of platforms and media used, but in the way that each interacts uniquely to immerse the audience into a story world (Jenkins, 2004; Thompson, 2010).

Transmedia storytelling is just one method of describing the way that a storyline or story world is distributed across media. Two other prevalent phrases are transmedia branding and transmedia franchising. In the case of transmedia branding, we see a specific brand, such as the casual mobile game, *Angry Birds*, being extended to other media/entertainment products, such as stuffed animal "angry birds" (W, 2011). Transmedia franchising expands branding, and refers to the corporate structure that extends specific media products across various media channels and business

partners. “Star Wars” is an example of the media franchise. Its corporate infrastructure supports the movement of the story across multiple media, such as the extension of the “Clone Wars” narrative into videogames and cartoons. In both transmedia branding and franchising, this movement across media does not necessarily serve to extend or enrich the story world, beyond simply adapting the content to fit different platforms (e.g., adapting a comic book to a motion picture, with little to no extension or expansion of the original story). In contrast, transmedia storytelling emphasizes the way in which a single story world is expanded with each different media channel that is added. In the *A.I.* movie, the sentient machine therapist Jeanine Salla was a film credit[14]. *The Beast* extended the *A.I.* universe, with Jeanine as a major character.

Jenkins (2006, 2011) borrows the term *additive comprehension* (from game designer Neil Young) to describe the ways in which each distinct medium adds depth to the story. Like the *A.I.* movie, the *Matrix* videogame (*Enter the Matrix*) did not simply adapt the screenplay to a game format – it added new elements to the story that were not in the original movies. Transmedia also extends the concept of *radical intertextuality*, which refers to the way that different texts across the same single medium (e.g., television) are used to extend a storyline. For example, taken together, the original *Star Trek* television series with Captain Kirk, and the follow-on series with Captains Picard and Janeway, are an example of radical intertextuality. If we extend radical intertextuality across different media, as when the Star Trek television

[14] and rabbit-hole to *The Beast*.

series extended into full-length movies, we have radical intertextuality evolving into transmedia storytelling (Jenkins et al., 2006).

As transmedia storytelling systems, ARGs are also moving into the mainstream, raising their rank as an area ripe for interaction design research. In 2010, the entertainment industry recognized transmedia storytelling as a significant emergent field by formally defining transmedia and ratifying "Transmedia Producer" as an official title and media production credit ((PGA) Producers' Guild of America, 2010)[15]. New media scholars have defined transmedia within a formal literacy framework (Jenkins et al., 2006), and game developers have established a game design award category for it ((G4C) Games for Change, 2011).

2.4.1.4.The Importance of Story Interconnections and Interactions

Brooke Thompson, whose career as a transmedia/ARG producer began just after she played *The Beast* in 2001, has adapted Jenkins' transmedia definition to emphasize the nature of the interactions that should be designed into transmedia projects (Thompson, 2010). Thompson's definition, like Jenkins', describes the transmedia story as a multimedia, multiple platform experience: "Transmedia projects are comprised of multiple media formats distributed on multiple platforms and where the platforms interact with each other in a complex relationship in order to create a larger and more complete whole" (Thompson, 2010). Like practitioners in the field of HCI and IxD, Thompson focuses on the way the story is conveyed through an expansion of interactions among the media used**.** Figure 2.3 displays the graphic

[15] The Producer's Guild of America's definition is a somewhat controversial issue among ARG designers, as shown here (by Christy Dena, transmedia scholar), and here (by Steve Peters, Experience Designer who has worked on several ARGs, including MetaCortechs and Why So Serious/Batman ARG). Most are off-put by the arbitrary minimum number (3) of "narrative storylines" (media platforms).

Thompson uses to describe multimedia, cross-media, and transmedia projects, distinguished by different levels of media interaction.

In simple multimedia products, the individual platforms do not interact at all. A marketing campaign may use multimedia to promote their products, but not necessarily to connect an announcement in one media channel or platform (e.g., computer) to others (e.g., TV commercial or cereal boxes). Similarly, cross-media (a term often conflated with transmedia) describes a unidirectional interaction between media used (Thompson, 2010). For example, a popular television show may maintain a website with information about the next episode or about characters in the show. But the connections are one-way: the character biographies do not extend back into the television series, and upcoming episodes do not affect existing ones. In cross-media, there is little to no additive comprehension among the media to convey a story. Finally, in a transmedia story, the interaction is complex. In network terms, a transmedia story is a fully connected, bi-directional graph (**Figure 2.3**). Although it may increase the complexity of the design, the more interactions available across media, the more natural and real the transmedia/ARG story feels.

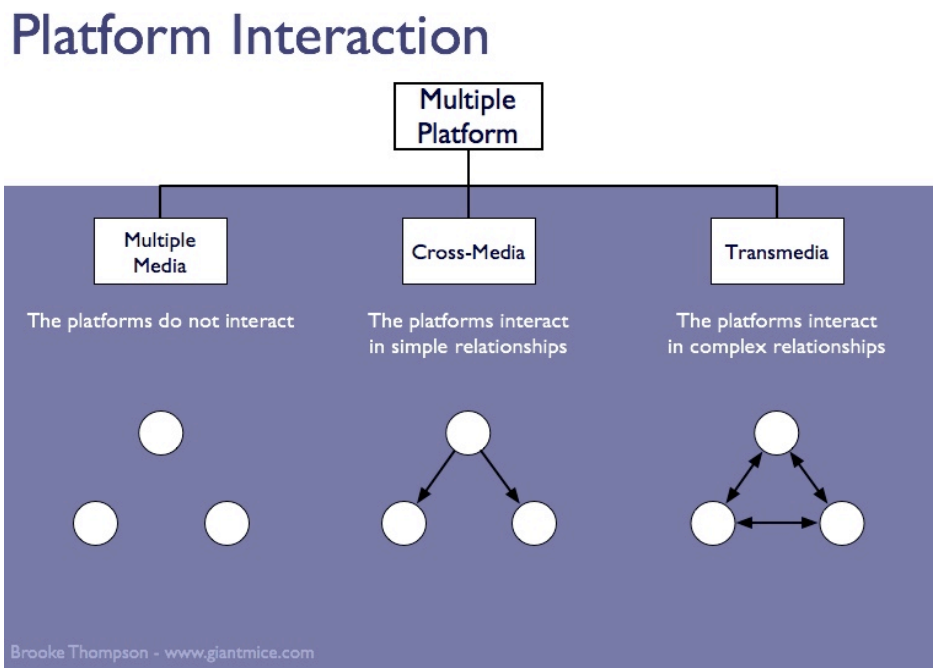


Figure 2.3: Multimedia versus cross-media versus transmedia.
Transmedia involves progressively complex interactions across media. (Thompson, 2011).

One of the most common examples shown to describe how multiple media can be used within transmedia experience is the movie, *The Matrix* (Jenkins, 2006, 2011; Thompson, 2010). The *Matrix* universe involved three different platforms: a videogame (*Enter the Matrix*), a series of video shorts (*The Animatrix*), a series of comics, and the three full-length movie series (*The Matrix, Matrix Reloaded*, and *Matrix Revolutions*). Although each can be experienced individually, only when an individual experiences all the media components can s/he get a sense of the complete *Matrix* Universe. For example, one of the *Enter the Matrix* videogame missions required an understanding of messages from the video shorts series (*The Animatrix*). As another example, a character from *The Animatrix* is featured in the final *Matrix Revolutions* movie, but his presence is only clear to those who also saw the video shorts (Thompson, 2009). **Figure 2.4** compares the bi-directional transmedia interactions in the *Matrix* to the more unidirectional interactions in the *Harry Potter*

transmedia franchise, in which books inform the movies, merchandise, and amusement park, but they do not influence the books' story experience.

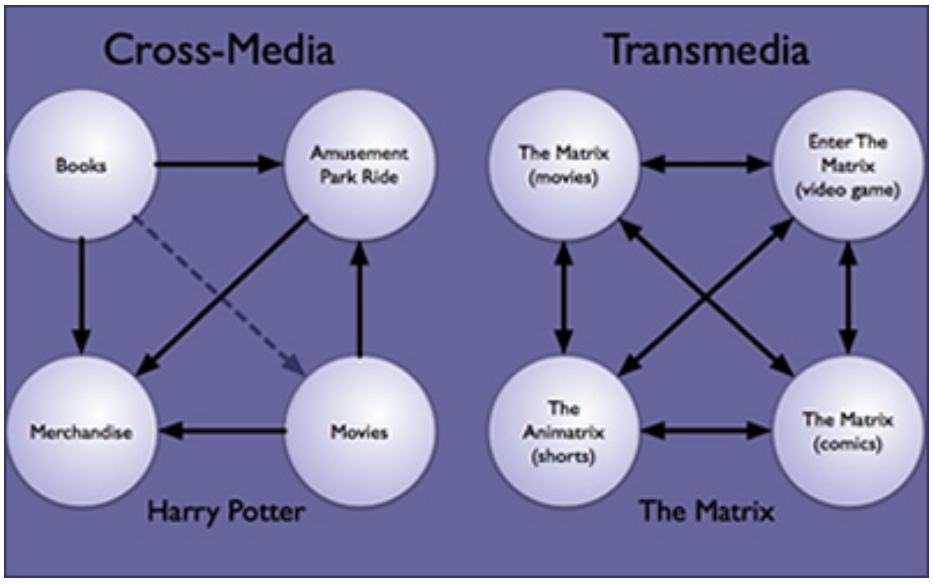


Figure 2.4: Cross-media and transmedia comparison: The Matrix versus Harry Potter. (Thompson, 2011).

Thompson's distinctions about the nature of the connections between nodes of the transmedia narrative network serve to emphasize the ways in which the media and puzzles must 1) connect to each other to best convey a story, and 2) help players navigate the story path. Two key ARG design issues emerge:

- In terms of a *Narrative Network*: How do designers create, disseminate, and connect story bits across multiple media (video, audio, text) and platforms (phones, computers, physical spaces)?
- In terms of *Player Networks*: How do designers connect the players to the distributed narrative content, as well as with each other?

A "missing link" in terms of ARG design, then, is finding ways to make visible any design criteria used to connect the links between story fragments. A design matrix may help designers and players decide which communications platforms and

tools "tell the story best." The same design matrix could inform how technology "genres" (wikis, blogs, micro-blogs, email etc.) can best serve narrative elements such as conveying information, enriching characterization, engaging reader/players in dialogue, or adding urgency/time-sensitivity.

Throughout this dissertation, ARGs have been described as transmedia storytelling systems whose story bits and interactive puzzles are distributed across multiple media platforms. As illustrated by the media types listed in Table 2.1, ARG designers embed these components in mobile phone text messages, websites, databases, videos, telephony, printed texts (books, magazines, newspapers, posters), and real people. The media and tools chosen must be considered based on individual features as well as how each interacts or integrates with other communication mechanisms. At an individual component level, ARG designers must consider the affordances and constraints of each technology they use to develop and advance the narrative. At a collective system level, ARG designers must also evaluate the ways in which multiple technologies interact to engage and scaffold players' sense-making strategies as they navigate the game-space. As diverse media genres are used to serve specific narrative ends, such as chat for dynamic dialogue between real players and in-game characters, or blog posts to present expository content, designers need to consider traversal cues and mechanisms across the media to help players find and make sense of the distributed storyline.[16] Further, the storyline should remain in the foreground as the interface, so that the technologies used to convey the story are as

[16] Ruppel (2009) calls these points at which one story fragment or puzzle leads players to another, "migratory cues." The ARG goal is to present migratory cues to players in ways that preserve immersion in the story – but also motivate players to act on the cues.

transparent as possible to players. The game-based challenges and puzzles that reveal story fragments may still require decoding, logic, or deconstruction skills. However, the accessibility, usability, and sociability of the technologies in which they are embedded should 'hide them in plain sight.' A primary goal of starting to develop a design matrix for ARGs, developed through analysis of the multiple cases, is to find ways to make the design criteria for connecting the links among the story pieces more visible.

2.4.2 ARGs through the lens of Curricular Design: Parallels between ARG design and Designs for Learning

Chapter 1 briefly summarized some of the ways in which an ARG can serve as a vehicle for players to acquire and practice skills such as collaboration and information evaluation. Current pedagogical models and literacy frameworks advocate that collaborative problem solving and information evaluation are among the 21st century literacy skills that students need to be learning to be successful in today's information society ((AASL) American Association of School Librarians, 2008; Cope & New London Group., 2000; Jenkins et al., 2006; (P21) Partnership for 21st Century Skills., 2009). In this section, I elaborate on the potential for ARGs to be designed as immersive learning experiences. I also map similarities between the game design and play activities in ARGs and the curricular design and lesson plan delivery mechanics of the classroom.

2.4.2.1. Socio-cultural and skills-based Literacies: A Review

Across disciplines such as the learning sciences, linguistics, and education over the past century, conceptions of "literacy" have evolved and expanded. I trace their transition from narrow perspectives of literacy as a set of text-based decoding

and production skills, to more expansive socio-cultural views. I include definitions of literacy from socio-cultural approaches and skills-based approaches. My goal is to highlight common themes that can be used in 1) describing existing literacy frameworks (e.g., Partnership for 21st Century Skills), then 2) deciding on one to use as a guide in ARG designs for learning. Literacy is an important term to define for my proposed study because:

- Several complementary literacy and learning frameworks have been established since the beginning of the 21st century that outline the cross-disciplinary collaborative, critical thinking, and problem-solving skills necessary for learners to succeed in an interdisciplinary and international world ((AASL) American Association of School Librarians, 2008; Jenkins et al., 2006; (P21) Partnership for 21st Century Skills., 2009);
- Several studies on player activity in ARGs demonstrates that they are effective environments for players to acquire and practice these 21st century literacy and lifelong learning skills (Bonsignore, Hansen, Kraus, & Ruppel, 2011; Dena, 2008a; M. Johnson, Buhler, & Hillman, 2010; M. Johnson et al., 2011; McGonigal, 2008a; Niemeyer et al., 2009; Whitton, 2008); and
- To design authentic environments that effectively promote these skills, we must have an understanding of how literacy and learning activities might be designed into ARGs, and how literacy-based outcomes might be assessed within ARGs.

Attempts to define literacy, literacy pedagogy, and the communications technologies that support them are not new. In their *Handbook of New Literacies*, Coiro et al. (Coiro, Knobel, Lankshear, & Leu, 2008) cite no less than 30 references,

from over four decades, with literacy or literacies in their titles. Similar statistics can be found in every survey of literacy research published toward the end of the 20th century, and into the 21st (Bawden, 2001; Cope & New London Group., 2000; Leu et al., 2004). A 2002 review estimated that more than five thousand articles addressing information literacy alone had been published from 1973-2002 (Tuominen, Savolainen, & Talja, 2005). These studies have defined "literacy" from a myriad of perspectives: in terms of general and technology-specific skill sets, theoretical frameworks, and technologies. They have applied a number of related terms for similar concepts, such as computer literacy, digital literacy, media literacy, critical literacy, and information literacy (Bawden, 2001; Bawden & Robinson, 2002). They have spawned new literacies based on specific domains, such as mathematical literacy (numeracy), science literacy, health literacy, visual literacy, environmental literacy, financial literacy (P21, 2009; Tuominen et al., 2005).

The discussions span multiple disciplines (such as linguistics, education, information science/technology, anthropology, business, policy studies, media studies), each addressing ‘what it means to be literate’ from their individual disciplinary perspectives (Coiro et al., 2008). For example, in sociolinguistics, literacy extends beyond the ability to decode symbols in texts (whether traditional print or multimedia) to an awareness of the variety of discourses interpretable from texts, such as context (e.g., when was this created, by whom?) and register (e.g., who is the audience, whose vernacular is being used?) (Gee, 2008; Street, 2003). The various ways in which media can be combined, presented, and interpreted across print and screen provide the backdrop for research on literacy in communications/media

studies (Kress, 2003; Sonia Livingstone, 2002). In educational technology, proficiency in using networked computing systems across content areas is emphasized as a critical component for literacy learning (Wepner, Valmont, & Thurlow, 2000). In the information/library sciences, to be 'literate' involves the ability to access, evaluate, synthesize, and communicate information -- itself a charged term (AASL/ALA Literacy Standards, 1998; Bawden, 2001; Bawden & Robinson, 2002; Lowe & Eisenberg, 2005).

The New London Group (NLG, 1996) represents one of the first attempts by language and literacy scholars to craft an interdisciplinary framework for literacy and literacy pedagogy. The NLG defined critical literacies to include not only reading and writing, but also the ability to access, interpret, share, and produce knowledge while engaging with multiple cultures, in multiple social contexts, integrating multiple modes of communication. More recently, the New Literacies Movement (Coiro et al., 2008; Lankshear & Knobel, 2003; Leu et al., 2004) have built upon this multiliteracies approach, emphasizing that the scale and speed of change in today's technology mandate a dynamic, deictic view of literacy. That is, the types, terms, and contexts of literacy are not only multi-modal and multi-faceted, they are constantly changing, given that the new information and communications technologies being used are continually emerging, and evolving, at exponential rates (Coiro et al., 2008; Leu et al., 2004). Concurrently, practitioners across education, information science, and the education technologies industry are developing skills-based frameworks to guide curriculum development and instruction (AASL/ALA Information Literacy

Standards for Student Learning, 1998-2009; Partnership for 21st Century Learning, 2009; Jenkins et al., 2006).

From this rich lineage of literacy studies, several common characteristics emerge. First, literacy is not singular construct, but a plurality. The NLG (1996) used the term 'multiliteracies' to account for the multiplicity of cultures that interact in a highly connected world as well as the increasing variety of technologies and representational modes with which these cultures connect. 'Multiliteracies' incorporates the notion that 'literacy' is multiple and multimodal. A multiliteracies stance also imports a sort of tension between specific and general domains of applicability: "*...although ethnographic scholarship has demonstrated the pluralities of literacies, their context-boundness, it still has also to account for general tendencies that hold across diverse case studies*" (Collins & Blot, 2003). That is, as people engage with one another in everyday or academic literacy practices, they call upon particular domains of knowledge, terminology, and skill-sets, based on their membership in various sociocultural groups (Gee, 2008; Street 2003). A 21st century, metaliteracies framework should acknowledge both domain-specific and general skills and practices.

In addition to their multiplicity, "*it makes no sense to speak about literacies without considering the technologies that embody them*" (Tuominen et al., 2005, p. 338). The NLG reflected a trend in literacy approaches that considered technologies as integral to literacy practices and pedagogy versus a specific or separate skill-set (e.g., computer literacy). Analogous to the way in which transmedia can be described as story-worlds that traverse multiple technologies and media formats, altering and

being altered by them, Bruce (1997) proposed a 'transactional account' for a close coupling of literacy practices and technologies: *"...technologies do not transform or determine literacies, nor could they ever be irrelevant to literacy practices. Instead, they are part of the continual reconstruction of literacies. As such, they too are constructed out of the evolving literacy practices. A transactional account [offers] ... a conception of a mutually constitutive relation between technologies and social practices*" (p. 303). Explicit emphasis on the interdependencies between literacies and technologies also accounts for the scale and rate of change of information/communications technology (Coiro et al., 2008). Literacy practices cannot be considered separate from the technologies they employ; likewise, technologies enable different types of literacy practices. Interaction with various technologies should be interwoven throughout a metaliteracies framework rather than separated from it.

A third characteristic common to literacy studies over the past 30 years is the belief that the literate person participates in communities with *"...low barriers to artistic expression and civic engagement, [and] strong support for creating and sharing one's creations...*" (Jenkins et al., 2005, p. 3). Today's literacy pedagogy must afford all individuals with opportunities to be active and productive collaborators in their communities, as it contributes to their own personal growth. Literacy practices are social practices. A metaliteracies framework should include collaboration and respect for diversity as well as ethical and legal norms.

Until the second half of the 20th century, the commonly accepted definition of literacy emphasized a "knowledge of letters…especially, ability to read and write"

(Simpson & Weiner, 2009). A literate person was one who could decode, digest, and create print texts; neither context nor community was considered a critical component. With the proliferation and increased accessibility of media formats, and the notion of the Information Society (Machlup, 1962), conceptions of literacy have expanded from a relatively narrow focus on reading and writing to a multifaceted set of communications practices enacted in multiple socio-cultural contexts, influencing and influenced by the technologies available for use. In a classic account of literacy as a social practice, Scribner and Cole (1981) asserted that "literacy is not simply knowing how to read and write a particular script but applying this knowledge for specific purposes in specific contexts…[it] comprises a set of socially organized practices which make use of a symbol system and a technology for producing and disseminating it" (p. 236).

As defined by Scribner and Cole, literacy practices include "three components: *technology*, *knowledge*, and *skills*" (p. 236, emphasis added). A social practices-based "technologies, skills, knowledge" triad accommodates past and current literacy studies that emphasize the multiple modalities in which information can be represented and interpreted (e.g., image, text, audio, screen), as well as the multiple channels across which they can be transmitted (e.g., networked, face-to-face, bound print). Similarly, Mackey's (2007) study of children's *Literacies Across Media* began from the premise that "it is now an unusual child who sticks completely to one medium alone" (p. 6). In the spirit of transmedia, Mackey asserted, "literacy… today involves an ecology in which print on paper is not the only route to making sense of texts… strategies can be imported across media boundaries" (p. 5-6). Finally, a

"technology, knowledge, and skills" construct also accounts for the ways in which various genres of literacy practices muster different sources of knowledge (e.g., topic details and jargon, audience, appropriate channels and modes) and skills (e.g., video-editing, blogging, word-processing, podcasting, gesture-based interaction).

For my study, the activities, behaviors, and attitudes of designers and players involved in ARGs have been observed, analyzed and described keeping this socio-cultural model of literacy in mind.

2.4.2.2. 21st Century Literacies Frameworks

An awareness of the evolution of "literacy" confirms the types of practices and skills that we intuitively feel students need to become lifelong learners and productive citizens. However, before we can effectively explore opportunities for embedding these literacy practices into ARGs for learning, we need a way to operationalize them. Several literacy/literacies frameworks exist that can support this. The framework of 21st century literacies that I plan to use is the Unified Metaliteracies Framework (UMF) for Transmedia Practices (Bonsignore, Hansen, Kraus, & Ruppel, 2012). The UMF was developed with the intent to harmonize socio-cultural approaches to literacy with skills-based approaches and frameworks. The three major literacy frameworks upon which the UMF is based are:

- *The Partnership for 21st Century Skills (P21)*. Developed during 2002-2009 by a consortium of education policy organizations and education industry partners, P21 frames educational goals in terms of four categories of skills: current US education core content areas and emerging themes (environmental, health, financial, civic literacies); learning and innovation skills; life and career skills; and information, media and technology skills.

- *The American Association of School Librarians (AASL)'s Standards for the 21st Century Learner*. Historically focused on the central role that information literacy skills play in the development of students' self-directed learning across subject areas, the AASL extended their "Information Power" standards (1998) to include multiple literacies (e.g., digital, technological, visual) and social and ethical contexts (2007).
- *New Media Literacies Conceptual Framework*. The New Media Literacies Project, supported by the MacArthur Foundation and comprised of media scholars, designers, and educators, emphasize collaboration and civic engagement and outline a framework that includes "a set of cultural competencies and social skills that young people need in the new media landscape" (Jenkins et al., 2006, p. 3).

The UMF metaliteracies are presented as active practices and processes, to emphasize their productive nature (**Figure 2.5**). The UMF's use of verbs (e.g., solve, collaborate, create, manage) also facilitates their incorporation as game mechanics in ARG design. Game mechanics are the underlying rule-based systems of games that define patterns of player behavior (Salen, 2008; Salen & Zimmerman, 2003). Game mechanics are at work when a player makes a goal-oriented choice and the game provides a meaningful outcome (e.g., collecting treasure, feeding a pet, solving a puzzle). They are often called the "verbs" of game systems in general, and are a functional fit for the UMF. *Evoke* used a similar "active agent" concept, categorizing player missions with the verbs, "Learn," "Act," and "Imagine" (Alchemy, 2010a).

Unified Metaliteracies Framework (UMF)

GATHER (finding, accessing, evaluating): the ability to locate, access, or discover appropriate sources and appraise them for a given information need.

MAKE SENSE (analyzing, synthesizing, and reflecting): the ability to make sense of information through analysis, synthesis, and interpretation; to aggregate dispersed components into a coherent framework.

SOLVE (problem solving, experimenting, and innovating): the ability to innovate and experiment to creatively solve problems and reach goals.

CREATE (creating, remixing, and modifying): the ability to meaningfully produce and remix artifacts and resources to express new understandings and insights.

MANAGE (managing, organizing, and preserving): the ability to carefully manage and organize personal and community artifacts and interactions for immediate and long-term use.

RESPECT (acting ethically, respectfully, and legally): the ability to honor diverse opinions, identities, and behaviors; and to act within ethical and legal frameworks.

COLLABORATE (cooperating, crowdsourcing, and communicating): the ability to effectively collaborate, network, and communicate across time and space.

Figure 2.5: The Unified Metaliteracies Framework (UMF).

2.4.2.3. ARG Design and Curricular Design

To reach a broad and diverse swath of individuals playing as themselves, using media they are comfortable with versus typical videogame controls, designers of ARGs must consider multiple content delivery mechanisms and multiple player types in their design decisions. Likewise, educators who design curricula and deliver lessons must consider variations in student ability and motivation. Just as educators must consider the efficacy and suitability of particular pedagogical techniques to support student interactions with academic content, ARG designers evaluate the affordances of particular media formats to support specific player interactions with game content. Comparisons to learning environments do not stop when the game begins. Dynamic interactions between ARG designers and players continue throughout the game. In the same way that educators design a lesson plan that they then dynamically adjust in response to student feedback during class sessions (Duffy

& Hoffman, 1999; Oser & Baeriswyl, 2001; Schon, 1984), ARG designers devise a detailed script that they collaboratively adapt with players during game-play. In many ways, the interplay between educator and student reflect the co-evolutionary relationship that exists between ARG designer and player.

Education research on curriculum and instruction has outlined a diverse and dizzying range of descriptions for curriculum (Gehrke, Knapp, & Sirotnik, 1992; Remillard, 2005). For example, "formal curriculum" refers to the goals, skills, and activities outlined by school policies or published as guidelines within textbooks; "intended curriculum" specifies teachers' goals for specific coursework; and the "enacted" or "experienced" curriculum details what actually happens in the classroom (Remillard, 2005, p. 213). For the purposes of my dissertation, the 21st century literacy frameworks summarized in section 2.4.2.2 served as "formal curriculum" guidelines for designing ARG narrative structures and game challenges ((AASL) American Association of School Librarians, 2008; Bonsignore et al., 2011; Jenkins et al., 2006; (P21) Partnership for 21st Century Skills., 2009). The "intended curriculum" will be reflected in the design of specific learning activities (e.g., an ARG activity that requires players to search for clues, or to share evidence and collaborate). The "enacted" curriculum will be described through systematic observation and analysis of the actual ARG activities. The different types of curricular design resemble the information ecology sense of locality (enacted being the most local/closest; formal being the largest/most abstract).

2.4.2.4. Assessment in Games

A study on ARG designs for learning must also explore opportunities to embed assessment into player interactions. In seeking a path for designing assessment

into ARGs, I have also reviewed research on assessment from game studies and game-based learning. On several levels, assessment in games has similar goals as assessment in education (Sheldon, 2011). Games offer positive reinforcement and continuous assessment, motivating players to persist through negative experiences (or failure) as they advance through levels of play that rise in difficulty to match their developing skills (Gee, 2003). These characteristics enable players to practice and master the skills that a particular game is trying to foster (e.g., being an effective SWAT leader, making survival decisions on the Oregon trail, planning power resources for urban development) within the game itself, not via a test after the game is done (J. Gee, 2003, 2008; Hickey, Ingram-Goble, & Jameson, 2009). In many ways, game structures and mechanics offer models for educators and designers alike to rethink assessment as a continuous and integrated process throughout learning rather than a disconnected, post-activity performance checkpoint (as noted in below comments, by Jim Gee, literacy, language and videogame expert).

> *"Assessment should be totally integrated with your learning.*
>
> *If you built the learning right, you should know that the person has mastered the stuff without having to then stop and give them a separate test on Tuesday at 4.…You could actually view a game as nothing but a continuous assessment. …We find it completely reasonable to give a kid a 12 week algebra course and then to assess them on Tuesday at 4 from a test made in Illinois to see if he learned, but if a player played Halo on hard and finished you would never be tempted to give him a Halo test afterwards because you know the act of finishing Halo is a guarantee and he knows how to play it. It's built to be sure he couldn't have finished it if he didn't master it"* (J. Gee, personal interview, Oct. 14, 2011).

Interactions within videogames and simulations (e.g., *Halo*) also have the advantage of being self-documenting. In videogames, and by extension, most ARGs, it is easier to capture digital interactions or 'activity traces', as Jim Gee points out: "*...since people are acting over time, you should be able to collect copious*

information on many variables to assess them on a trajectory of learning or development of growth not just the one shot picture." (Gee, Oct. 2011 interview.) The data produced from the learning process is more comprehensive, and students are likewise more aware of their own progression, challenges and successes.

Just as game designers work to improve their players' experiences through analysis of their interactions from initial to "boss levels," continuous assessment models offer more authentic perspectives of student learning experiences. Indeed, with more iterative, integrated assessment models, the results of traditional standards-based tests can function in a formative sense (Hickey et al., 2009). They might be used to improve ever-evolving curricula, and provide a more comprehensive picture of student learning and development over time –even grade levels –not just from one isolated subject or semester to another.

Like other learning experiences, games can be designed to deliver learning content, such as math, science, or history-related concepts and facts (Gee, 2003; Klopfer, 2008). More importantly, games excel at fostering learning mindsets that "are intrinsic to the game while the students are learning the content. Through game play, students learn how to collaborate, solve problems, collect and analyze data, test hypotheses, and engage in debate" (Klopfer, 2008, p. 19). These literacies can be difficult to measure with traditional standards-based tests, but may benefit from multiple, iteratively implemented assessments, from close and proximal (class-level) to distal, end-of-course, standards-based exams (Hickey et al., 2009).

Some of the systemic possibilities inherent in existing ARGs include peer-based evaluation and assessment through collaborative interactive environments

(McGonigal, 2011). Game-based assessment is a more integrated experience, and thus less inherently isolated, than a traditional quiz or examination. As the integration of technology and digital tools is increasing, classrooms already use multiple platforms for instruction – using both physical (in-person) and simulated or virtual collaborative spaces. Another trend in classroom game design is the outright "gamification" of assessment, as Lee Sheldon pioneered in his massive-multiplayer game inspired classroom, where students earned experience points, joined guilds, and "leveled" their way to an A (Sheldon, 2011). All of these design options could serve as embedded activities within an ARG in an educational context.

Well-designed games often provide situated learning contexts that support deep learning: they include rich, compelling narratives; require players to engage in individual and collaborative problem-solving activities; and offer opportunities for players to assume authentic, community-valued roles as investigators, engineers, archeologists, artists, etc. (Gee, 2008; Shaffer et al., 2005). As socially situated, interactive media experiences, ARGs also incorporate several of the features that promote deep learning (Gee, 2008): they provide compelling narrative contexts and require collaboration to complete.

As an organic learning experience, ARGs demand that players acquire and practice literacy skills such as collaboration and information evaluation, skills that current pedagogical models/literacy frameworks say students need to be learning to be successful in today's information society. The design issue is not *if* ARGs can be good for learning, but *how* we embed opportunities to participate in these activities and practices into the ARG story as well as how we build the assessment into the

activities themselves (similar to the built-in assessment process of games). My primary means for investigating this question was the empirical analysis of several ARG design processes, such as how opportunities for collaboration were balanced with individual player efforts in the *AGOG* case study (Chapter 4).

2.5. Summary

In this chapter, I have defined and described the information ecology as the conceptual framework guiding my study. I have categorized a collection of past ARGs in terms of information ecology characteristics, to demonstrate how these features might inform the design of future ARGs. I surveyed the research in transmedia storytelling and human-computer interaction to lay the groundwork for developing a design matrix that can support the decision-making process for ARG designers. I summarized predominant literacy frameworks and drew parallels between research on game design and curricular/learning activity design, to uncover opportunities for implementing ARGs in educational contexts. In Chapter 3, I transition from what we know about these research perspectives on ARGs to building the methodological approach that I used to extend our knowledge of ARG design.

Chapter 3: Methodology

In this chapter, I expand upon the research plan introduced in Chapter 1, reviewing my research questions, providing a rationale for the embedded, multiple case study design selected to address these questions, addressing its potential challenges and limitations, and laying out the data collection and analysis I conducted for my study overall.

3.1 Review of the Research Questions

As discussed in Chapter 1, relatively few studies on ARGs to-date have focused on the design processes involved or the interactions between the technologies used to construct and convey the ARG narrative, or to embed game challenges and interaction within it. Some have touched on the ways in which narrative co-design continues with players even after the game has begun (McGonigal, 2007, 2008a). A handful have aimed their sights to target the potential of ARGs in the service of learning (Colvert, 2009; Niemeyer et al., 2009; Whitton, 2008). All of these, however, have focused mostly on the way that players have interacted with the finished ARGs, rather than on the design process itself. Of these, only one or two have focused on a teen audience. The goal of my study was to gain a clearer picture of the multi-varied components of ARGs and their interrelationships as they evolve, from initial narrative ideation to interaction design and implementation. More specifically, my aim was to move beyond discussions about the *potential* of educational ARGs to an examination of the ways in which two design teams tackled the process of explicitly engineering learning goals and mechanisms into their small scale ARGs. I have explored their ARG design process through the following analytic

lenses and guiding questions, using an information ecology metaphor as an organizing framework (Nardi, & O'Day, 2000):

- *ARGS through the lens of interaction design*: What challenges do design teams face when designing ARGs? What design choices and tradeoffs must ARG designers deal with? How must ARGs be modified for a young teen audience?
- *ARGs through the lens of curricular design*: How can ARG-design enable and foster collaborative learning and 21st century literacy practices? How can we map the design and play mechanics of ARGs to the curricular design and classroom delivery mechanics of lessons?

I investigated responses to these questions using a mixed method, multiple-case study research framework. Case studies are characterized by a close examination of complex systems (Lazar et al., 2010), within a real-life context, when responses to "how" or "why" questions are the goal (Yin, 2009). As described throughout my literature review and introduction, ARGs represent complex ecosystems designed for, and enacted within, real-world contexts (i.e., not suited for study in lab settings). Furthermore, the overarching research questions I have posed seek to understand *how existing ARGs are designed and played* so that we may develop a design plan that *informs how emerging ARGs should be designed* and played, with a focus on learning and new media literacies. A case study design supports such questions regarding "how" to design ARGs for learning.

Two ARG design scenarios, distinguished by target learning environment (formal or informal contexts), comprise the two cases I covered in my study. The

Arcane Gallery of Gadgetry (*AGOG*) was designed primarily for formal education contexts (middle school level, or 13-15 year olds), and is the context for my first design case (*AGOG* case). A series of ARGs developed as part of a rural public library's summer-reading program comprise my second design case (*Finksbrary* case). The Finksbrary case represents the informal, after-school context for ARG design. Again, few ARGs have been created that focus on learning contexts, and even fewer have targeted teen audiences. The two cases that I have studied number among the first that have focused on adolescents (13-17 years old).

I have applied an embedded case study design: for each case, I collected and analyzed data on the ARG design process and game play results. I bounded the case study of *AGOG* from the core design team's initial planning through its implementation with eighth graders (August 2010 through April 2011). I bounded the Finksbrary case study by focusing on the final year that the core design team (one librarian and three teen girls) collaborated (Oct 2010 through Sept 2011). However, the Finksbrary design team enriched the data I collected and analyzed by also sharing details from their design experiences from the previous two summers (June 2008 – Oct 2010). Including post-game interviews conducted with select members of both design teams and on-going interviews with experienced ARG designers, the overall timeframe during which I collected data for both cases extended from January 2010 through December 2012.

3.2 The Embedded Multiple Case Study Design

As noted earlier, a case study framework is well-suited to support rich characterization of complex phenomena in natural settings (Lazar et al., 2010; Yin,

2009). Given my research goals to analyze how ARGs can be designed to support literacy skills, with a focus on the process of multidisciplinary, collaborative design and the ways in which puppetmasters or ARG designers connect players to distributed content (i.e., help make new media content and opportunities for learning accessible) was an apt methodological approach.

As a qualitative approach, case studies focus on one instance within broader phenomena of interest (Barone, 2004; Dyson & Genishi, 2005; Yin, 2009). The broader phenomena of interest for my investigation involved the ways in which various interactive transmedia systems are (or could be) designed, and included the various components that comprise transmedia experiences like ARGs. Specifically, I focused on the design of ARG ecosystems that aim to support new media literacies, such as those outlined in the Unified Metaliteracies framework (Chapter 2), the New Media/Participatory Literacies framework (Jenkins et al., 2006), and standards for the 21st century learner (American Association of School Librarians., 2007). My two design cases, ARGs developed and implemented within two different learning contexts and created specifically for teens, reflected specific instances that embody the broader phenomena of interest, design processes for interactive transmedia experiences like ARGs. For each design case, the primary unit of analysis was the ARG ecosystem itself (e.g., the designers, the transmedia elements and narrative, interactive components, the players). As a start for each case, I used the properties of information ecologies (system, diversity, coevolution, keystone species, and locality) to frame my analysis of their salient design dimensions.

Of the four variants of case study research designs (single case holistic, single case embedded, multiple case holistic, multiple case embedded), I used the multiple case, embedded case study design (see Figure 3.1 for visual representations of these classic case study configurations) (Yin, 2003, 2009). I decided on a multiple case design because I sought to understand how differences between formal and informal contexts might affect both the design process and game play, and because I had the opportunity to study ARG design in both contexts. My decision to use

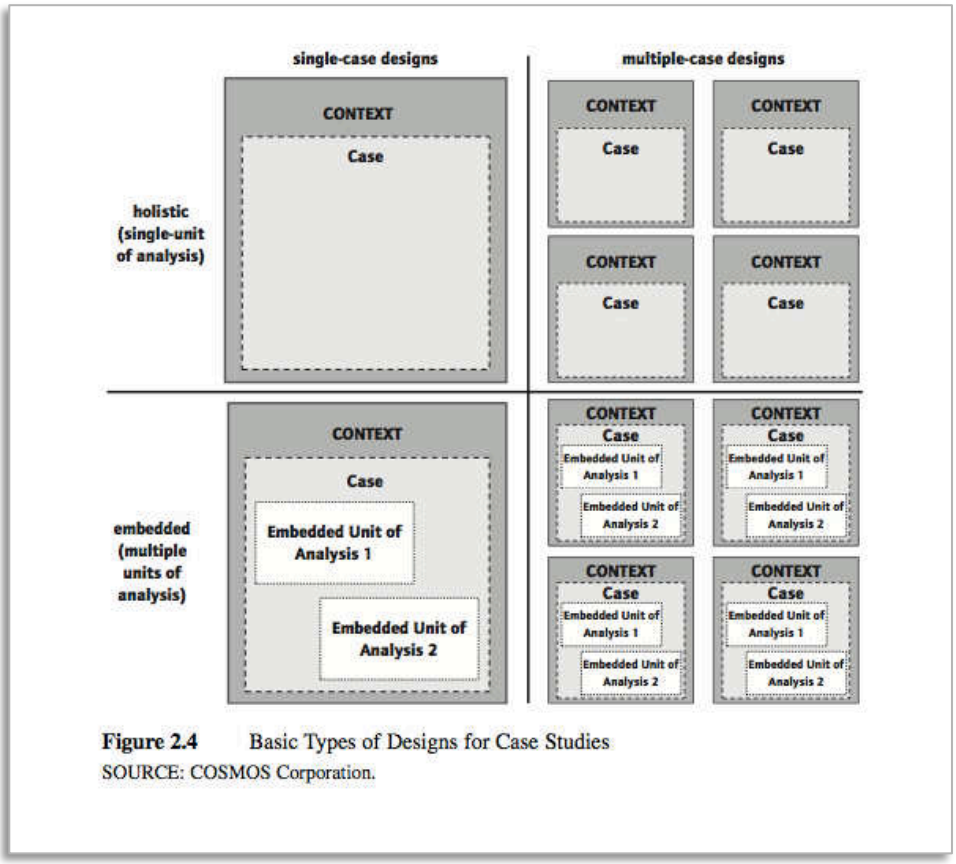


Figure 2.4 Basic Types of Designs for Case Studies
SOURCE: COSMOS Corporation.

Figure 3.1: Types of Case Study Designs.
Graphic depicting basic types of case study designs, from single to multiple cases that contain embedded units of analysis (Yin, 2003, p. 40)**.**

an embedded design for each of these cases afforded me an opportunity to shed light on multiple design dimensions (e.g., designing for 21st century literacy skills; designing multimedia/transmedia narrative and gameplay elements). However,

embedded designs also add complexity and potential ambiguity in terms of units of analysis. In the following sections, I detail the strategies I followed to maximize the effectiveness of this methodological design choice while minimizing its potential complications.

3.2.1 Single versus Multiple Case Study Design

Single case designs are appropriate when the case under investigation fall into one of the following categories:

- a "critical case in testing a well-formulated theory" (Yin, 2009, p. 49), similar to experimental designs;
- an extreme or unique case;
- a typical, or representative case;
- or a longitudinal case (Yin, 2009).

Stepping through each of these investigative options for a single case study on ARG design:

- There are no well-formulated theories about ARG design that can be tested using an experimental design, because there have been relatively few studies that focus specifically on ARG design to date – especially those explicitly designed for teens in learning contexts. Consequently, applying an experimental design for my cases was not viable.
- At this point in the evolution of ARGs as a genre, investigating an "extreme" ARG case (e.g., *Free Fall*) would not be informative in terms of generating a repertoire of best practices for ARG design in learning contexts, or to identify

common challenges encountered by designers who are designing for teens in learning contexts.

- Because ARGs are an emerging form of immersive storytelling and collaborative sense-making, there is not yet a typical or representative case (though there are common features across most ARGs, as detailed in my Chapter 2 literature review). Instead, "representative" ARGs may be best considered as a set of categorical cases, grouped according to various design dimensions according to target audience goals. For example, ARGs can be categorized by contextual criteria such as locality, if we partition them as being implemented in formal or informal learning spaces. Another way to contextually categorize ARGs is by format, such as interactive book plus online forums or urban street game. We can also classify ARGs by purpose, such as using them to market other entertainment properties, like movies; or developing them to promote specific learning outcomes. The two ARG design scenarios that comprise my cases are representative of the nascent category of learning-based ARGs, but each took place in a different context, with different design teams and endgame goals. Taken individually, they represent two single case studies; together, they form a multiple case study design.

Multiple case designs are often considered more robust than single case designs, because they reduce the chance of singling out a non-representative case of the phenomenon under investigation (Yin, 2009). Multiple case studies also increase the variety and volume of data that can be collected to reliably explore a topic. However, the resources required to cover multiple cases adequately is a concern and

needs to be considered carefully (Yin, 2009). With regard to my study, a multiple case design worked well because it avoided the possibility of misrepresentation with a single case, and allowed me to explore ARG design processes in both a formal and informal education context (formal social studies classes and a summer library program). I was also able to examine ARG design from the perspectives of experienced and novice designers (ARG experts, education practitioners, and graduate students, as well as youth who represented the target audience).

When designing and executing a multiple case study design, the risk of collecting more data than is feasible for one investigator is a valid concern. Here, I benefited from the fact that my study was situated within a larger, National Science Foundation-funded research initiative that investigated various design aspects of ARGs (NSF IIS-0952567). The larger project afforded me ready access to the *AGOG* design team, as well as some administrative support in terms of data collection and pre-formatting for analysis. For example, I had access to the *AGOG* database that had logged student interactions and gameplay artifacts, so I was able to export and build upon that database during my analysis rather than develop a new system for collecting the interactions in the first place. In addition, the project data repository already contained the transcriptions of many ARG expert interviews, which relieved me of some transcription work during my final data analysis.

3.2.2 Embedded Multiple Case Study Design

In deciding how to frame a multiple case study investigation in terms of unit of analysis, I had to establish how I might partition my broad questions on the design process for educational ARGs into more specific units of analysis. In an embedded

case study design, analytic attention is also given to *sub*units within the case(s) (Yin, 2009). For example, if the primary case involves an organization such as a hospital, sub-units of analysis might be comprised of different services, personnel, or departments within the hospital (e.g., medical staff and non-clinical services). Quantitative analyses of hospital employee records could also add an embedded subunit. Similarly, if the primary case involves a broadly applied technical innovation, such as new educational technology installed across a school district, a comprehensive analysis of its effects could include the teachers and administrators within the school district, with each group representing an embedded subunit that is impacted by the technology.

For my multiple case study design, the embedded units of analysis were applied according to the analytical lenses that frame my research questions:

- *Embedded subunits through the lens of interaction design*: To develop a repertoire of design strategies that support the distribution of narrative and game activities in an ARG, my embedded units of analysis included the media used to create an interactive narrative and the infrastructure used to support these media, the narrative elements themselves, and player interaction (e.g., the player community site), with an emphasis on the types of challenges and design tradeoffs that ARG designers had to deal with as they create ARGs for teens in learning contexts.
- *Embedded subunits through the lens of curricular design*: The literacy practices and skills outlined in the discussion of 21st century literacy frameworks from Chapter 2 (*section 2.4.2*) were applied as the embedded

subunits for highlighting design patterns that support learning and literacy in ARGs. For example, specific design decisions made to promote balanced collaboration and participation from all players formed one embedded unit of analysis for the *AGOG* design case. The framework for coding analysis for these decisions was taken from Johnson et al.'s (1994) principles of cooperative learning.

In Figure 3.2, I adapted the generic diagram of design types for case studies from (Yin, 2003, p. 40) that is depicted in Figure 3.1 to illustrate my two-case, embedded design.

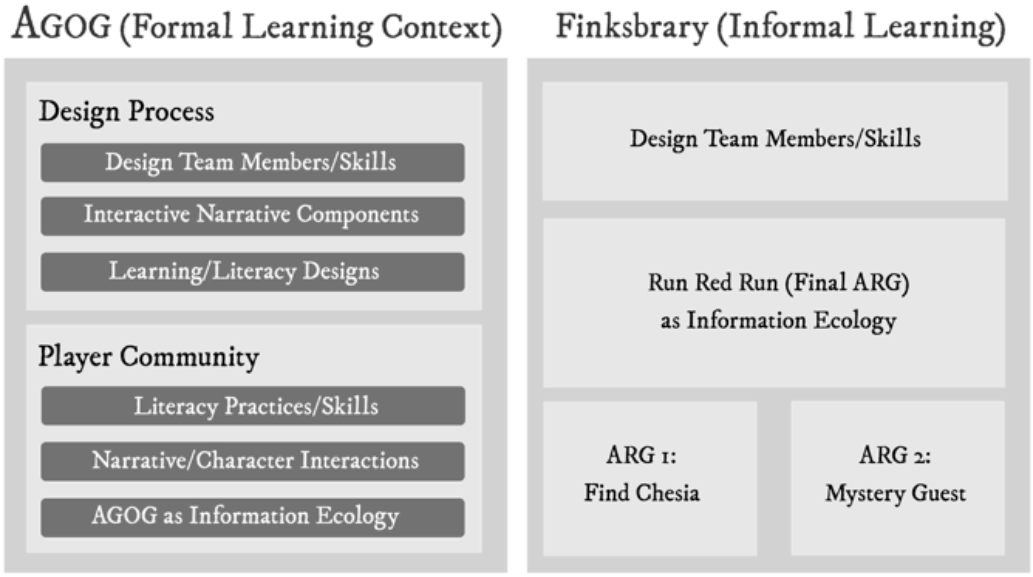


Figure 3.2: *AGOG* / Finksbrary adaptation of Yin's (2003) multiple case study, embedded design. The sub-units for AGOG include the 1) design process and 2) player community, and within each of these aspects, I analyze elements of interaction design and learning design features and outcomes. Similarly, for the Finksbrary case, the focus is on the design team and the evolutionary process they followed to develop their three summer ARGs.

3.2.3 Replication in Multiple Case Designs

A primary aspect to consider when developing a *multiple* case study design is *replication*, a concept that "is analogous to that used in multiple experiments" (Yin, 2009, p. 54). For example, if an experiment yields a significant finding, an

experimental priority would be to determine if the finding could be replicated by conducting more experiments. The follow-on cases would be designed to duplicate the conditions of the original experiment, or to change one or more conditions to determine whether the original result could still be reproduced. That is, each case in the set of multiples cases is selected such that it can help predict:

- Similar results (*literal* replication) or
- Contrasting results for anticipatable reasons or hypotheses (*theoretical* replication) (Yin, 2009).

Both of my case studies were *selected* with an eye towards literal replication. Within each case, the analytic lenses remained the same, with the goal of gaining insights on the types of interaction mechanisms, narrative strategies, and designer skillsets involved in creating ARGs in any learning context. However, the different *local contexts* (formal or informal learning) that the two cases represent also enabled analysis and discussion from a theoretical replication perspective: i.e., what are the differences in ARG design processes if the learning contexts are different? For example, what components of an ARG design matrix might be of less concern in a formal context than they were in an informal context? The issue of recruiting participants might not be a major design issue in formal learning contexts, but might be a critical consideration for informal learning contexts. Conversely, what design issues are of little concern in informal contexts when compared with formal contexts? For example, establishing direct performance measurement criteria is not typically a primary concern in informal education contexts (although it may be of interest to

consider how an ARG in an informal learning context can support and transfer to higher engagement levels and performance in a formal context).

From a data analysis perspective, replication in multiple case studies often occurs over time, versus simultaneously (as in randomized experimental trials), so that "each case's conclusions are then considered to be the information needing replication by other individual cases" (Yin, 2009, p. 56). That is, any design themes or patterns that emerge from the first ARG developed in the Finksbrary case might be themes to look for in their second or third ARG. Ideally, evidence of design themes that emerge from both cases might be replicated in future design studies of ARGs in learning contexts. This is analogous to the process of design-based research in the learning sciences (Barab, Sadler, Heiselt, Hickey, & Zuiker, 2007; Hoadley, 2002), in which findings from early cases inform the design and analysis of future iterations, with all contributing to the development of theories of learning. One of the primary reasons why I framed my study with these two cases was to try to determine what elements of ARG design in learning contexts might serve as a basis for design-based "replication" in future iterations of ARG design studies.

3.3 Data Collection

A case study can be described as an in-depth investigation that:

- Is limited to a small number of cases (to maximize depth of study yet maintain feasible scope);
- Enables examination in *context;*
- Collects data from multiple sources;
- Emphasizes qualitative data and analysis (Lazar et al., 2010).

The multiple case study approach I designed satisfies each of these criteria, as shown in Table 3.1. The table summarizes the multiple data sources that were collected (interviews, game artifacts, design documents), to ensure that an in-depth study was executed. A multi-method approach allowed for redundancy of data collection and triangulation from multiple perspectives during analysis, which helped verify data interpretation and clarify emergent themes (Stake, 2005; Yin, 2009). Other sources of evidence included field notes and audio recordings of ARG design meetings for both cases.

Table 3.1 Data Collection Overview

Participants and/or Case	***AGOG*** **(Formal Learning Context)**	**Finksbrary Team (Informal Learning Context)**	**"Expert" ARG designers & scholars**
Data Sources	**ARG Design Team** nf = 6 (University researchers and creative writer) **Players** n=58, 13-15 years old	**ARG Design Team** 1 Youth Services Librarian 3 Teen Designers (12-18 years old during study)	Interviews with experienced ARG designers in industry (e.g., Sean Stewart, Ken Eklund) and education (e.g., Nicola Whitton, Antero Garcia); game-based learning scholars (e.g., James Gee) n = 17
	• Design documents (wiki, email, paper notes) • Participant observation (audio recordings of design meetings, field notes) • *AGOG* artifacts (game website, in-class artifacts, post-game survey) • Interview with AGOG creative writer	• Design documents (wiki, paper notes) • Participant observation (audio recordings of design meetings, field notes) • Residual ARG websites, videos • Interviews	
Timeframe	August 2010 – April 2011	June 2008 – September 2012	Jan 2010 – Dec 2013

The data sources included in my data collection plan fell within the six sources of evidence most commonly used in case studies: documentation, archival records, interviews, direct observations, participant-observation, and physical artifacts

(Yin, 2009). The ability to compile data from multiple sources of evidence is considered a major strength of case study data collection, and it is typically recommended that case study research include as many sources of evidence as possible (Yin, 2009). Multiple sources of evidence provide multiple measures of the same phenomenon, which strengthens the study's construct validity and enables the development of "converging lines of inquiry" (Yin, 2009, p. 116). The challenge of including multiple sources is to maintain the feasibility of the case study: not enough sources and the construct validity of the case study is weak; too many sources and the study may become infeasible for one researcher. For my study, I worked to ensure the volume of the data collected remained within my limits of analysis.

To ensure that the approach was sound in terms of data triangulation, I used multiple sources of data. For example, design themes that I observed recurring across chat sessions, the post-game survey, and field notes from daily in-class sessions in the *AGOG* case increased the reportable strength of those themes. Because the *AGOG* case was part of a larger research initiative, I benefited from investigator triangulation (Patton, 1999; Stake, 2005; Yin, 2009). Fellow evaluators in the larger study reviewed my analysis and pointed out ways to improve it as well as confirm its internal validity and reliability. To help mitigate the potential for researcher bias in the inferences drawn from interviews and design session observations, I also carried out member checks (Lincoln & Guba, 1985; Stake, 2005) with the participating librarian in the Finksbrary case.

In addition to the data collected for the two design cases, I also had access to interview recordings and transcripts for a diverse set of 17 game designers and

researchers who have experience producing ARGs or studying ARGs and similar immersive interactive experiences. Although I arranged and conducted the interviews for six of these interviews, I benefitted again from being part of a larger research project in that most of the interviews were conducted in collaboration with other researchers, and many were transcribed for the research team by an external resource. Eight of the interviewees are established professionals in the entertainment industry (transmedia writers, producers, and designers). The rest of the participants include games studies and new media scholars, librarians, and museum professionals. Two have produced ARGs specifically for undergraduate-level educational environments (M. Johnson et al., 2010; Whitton, 2008), and two have produced ARGs targeted for teenagers and tweens (Niemeyer et al., 2009; Whitacre, 2011). In addition to the Finksbrary librarian who led her team of teen ARG designers, one other interviewee designed ARGs to support informal learning and cultural institutions (libraries and museums) (Goodlander, 2009; 2008). Other HCI studies have also interviewed designers and researchers to gain insights into their approaches to the design of immersive transmedia experiences and interactive games (Benford, Giannachi, Koleva, & Rodden, 2009; Isbister, Flanagan, & Hash, 2010); however, this study's inclusion of several designers from *outside* of the entertainment industry spotlights the potential value of their perspectives *beyond* highly professional contexts (i.e., in secondary school environments).

3.4 Data Analysis

As reflected in Table 3.1, my study emphasized qualitative data and analysis: it included qualitative sources of data such as interviews, audio recordings of design

meetings, field notes from design and game-play sessions with study participants, and my own insights as a participant-observer (I was a member of the *AGOG* design team).

I followed a grounded theory approach (Charmaz, 2006; Corbin & Strauss, 2008) to conduct an in-depth content analysis of all of the data collected. Although open coding was used within each case, the five properties of information ecologies (system characteristics, diversity of tools/skill sets needed, co-evolution of designer/player, evidence of keystone species, locality) also helped frame my initial pass through each type of data (e.g., was the interview comment about the ARG's context/locality or a required skill?). The two analytic lenses (interaction design and curricular design/literacy frameworks) helped focus my coding iterations. For example, interviews could be coded first from an information ecology attribute (e.g., co-evolution), then from the perspective of interaction design or learning/literacy design. Here are few examples of my approach to analyzing the case study data:

- For co-evolution: I would look for moments where the design teams found ways to help players who were uncertain about how to tackle a problem (such as providing a means for a character to share a resource as a hint, or providing a narrative reason for players to be "trained"); or
- For system and diversity: I would explore design options that the teams tried that highlighted how players might interact with different media formats to uncover and share story events in authentic ways (such as audio or video);
- For keystone species: I investigated how the design teams created characters or designers with specific skills could promote different learning aspects.

As I gathered and analyzed different types of data for a case (e.g., after transcribing an interview or making a first pass through a wiki page and its comments), I would first make constant comparisons across existing data within that case (Boeije, 2002; Holton, 2007; Kolb, 2012). For example, I might check whether a code for an interview comment about a specific moment in the design of a Finksbrary ARG was corroborated in interview comments from another designer or in the wiki data that corresponded to the moment being described. I then compared themes that were emerging across my two cases (e.g., design session notes from each case that might corroborate the same design concerns or solutions, etc.). In this way, I tried to maintain a strong chain of evidence between my research questions and the design themes that emerged from this iterative process of selective coding and comparing across multiple levels of data (Yin, 2009, pp. 122–124). Although Table 3.1 provides a summary of the data I collected and analyzed across the two cases, I give more specific details in the chapters for each case (Chapter 4 for *AGOG*, Chapter 5 for Finksbrary).

Chapter 4: *AGOG* Case Study

In this chapter, I explore the design strategies used by a university research/design team to develop the Arcane Gallery of Gadgetry (*AGOG*). Specifically, I examine the choices and tradeoffs that the *AGOG* team made to design their ARG's *transmedia interface* and *participatory narrative* while promoting *authentic* interaction, with a focus on when, where, how, and why they had to tailor these ARG features in a formal learning environment (an 8th grade social studies classroom). The results of my analyses of the team's design strategies tie directly to my first research question (regarding ARGs and interaction design). Before examining the team's design process from these broader ARG elements, however, I conducted a pilot study to investigate the design process and results of integrating cooperative learning techniques (D. Johnson et al., 1994) into *AGOG*'s narrative and game-play. I conducted a focused analysis of how the UMF literacy, "Collaborate" (Figure 2.5) was designed and played out in *AGOG* (*sections 4.1-4.3*) to determine the utility and feasibility of using an embedded case study design where various literacy practices (e.g., "Collaborate," "Make Sense") could be traced from initial ARG design phases through ARG launch and endgame. This embedded analysis is directly tied to my second set of research questions (regarding the intersection of ARG design, curricular design, and literacy practices). I include an evaluation of the observed effects of all of the *AGOG* teams' design decisions during gameplay.

4.1 Purpose of the AGOG Embedded Case: Designing for Collaboration

The *AGOG* embedded case had two objectives, one tied to the ARG design process, the other tied to the research design of my dissertation (i.e., a methodological

objective). With regard to the ARG design process, the embedded case focused on the ways in which instructional techniques such as cooperative learning can be incorporated into ARGs to promote critical thinking and collaborative problem-solving skills. This design objective is aligned with my study's overarching goals to empirically connect curricular design approaches to ARG designs for learning.

With regard to the methodological approach, this case helped to test the viability of the embedded multiple case study design. It does so by following the chain of evidence of a specific embedded unit of analysis (Yin, 2009): the process of designing collaborative learning into ARGs from early design meetings through endgame. The pilot case may also serve as a model for replication. Successive analyses of other embedded units of interest, such as opportunities to embed authentic assessments or the process of counterfactual design, can benefit from applying the process followed here.

I should reiterate that I am a member of the *AGOG* design team. My role in the design of *AGOG* has implications for research design and reporting. As a participant-observer, I was afforded direct access to all collective design-related data, and I had the opportunity to follow the development of the design, and the rationale behind it, first-hand. This "inside" access and perspective has often been considered "invaluable in producing an 'accurate' portrayal of a case study phenomenon" (Yin, 2009, p. 112). Opportunities to manipulate minor events or elements arise as well, which may "not be as precise as those in experiments, but can produce a greater variety of situations for the purposes of collecting data" (R. Yin, 2009, p. 112). The potential problems that arise in participant-observation include bias (sympathy for

participants may affect the researcher's perspective) and divided attention (objective observation and associated data collection may be difficult to do concurrently with participation). These potential analytic limitations were mitigated through "member checks" and coordinated analysis with other designers on the team (Lincoln & Guba, 1985; Stake, 2005). In terms of reporting/write-up, I use third person designations ("design team," "designers," "puppetmasters") interchangeably with second person pronouns ("we" designed, "our" design goal).

4.2 Collaboration, ARGs, and Cooperative Learning

As detailed in Chapter 2, a well-designed ARG engages players in 21st century literacy practices, such as evaluating and sharing information across multiple media, analyzing complex problems, and using new media tools to re-interpret existing content or create new expressions (Bonsignore et al., 2011; Jenkins et al., 2006; M. Johnson et al., 2010; Niemeyer et al., 2009; Whitton, 2008). In most ARGs, players don't acquire and practice these skills alone. They are participating as members of a collective problem solving, shared storytelling community. In an increasingly connected world, collaboration may be one of the most important 21st century skills in which ARGs can engage their players.

Although the inherent community-based, "collective intelligence" characteristic of ARGs holds potential to promote socially situated learning (Jenkins et al., 2006), player participation is often lopsided. Active players, those who find clues, solve puzzles, and synthesize information to advance the story, represent a fraction of the total players involved in an ARG (Gurzick et al., 2010; Kim et al., 2008). The majority are bystanders or "lurkers" who do not participate in the story

except at a minimal level, such as passively experiencing it through the latest story updates from a player community website. To mitigate this uneven active participation ratio and to realize more fully the potential of ARGs in education-based contexts, the *AGOG* design team investigated ways to incorporate cooperative learning constructs (e.g., Johnson et al., 1994) into their design.

4.2.1 Related Efforts in Game-based learning and Augmented vs. Alternate Reality

Game-based learning studies over the past decade have investigated the knowledge-building activities of players in single and multiplayer videogames (Squire et al., 2005; Steinkuehler & Duncan, 2008); the authentic scientific inquiry practices of players in multi-user virtual environments (MUVEs) (Barab et al., 2007; Dede et al., 2004); and the ways in which role-playing activities ("playing an environmental scientist") enable players to adopt epistemic frames, or ways of knowing and working within specific in-game contexts that can transfer to "real-world" contexts (Shaffer., 2006). Socially situated opportunities for learning are embedded in the narrative frameworks for all of these games (e.g., players help a civilization similar to ours to solve a critical environmental issue). However, design-based techniques that directly engineer collaboration into these games have been largely a secondary, not central design concern. Further, most of this research has been focused on games that employ 3D gaming or virtual reality environments, rather than everyday technologies such as those used in ARGs.

Research by Klopfer, Perry, Squire and Jan (2005) on *augmented* reality game design represents one of the few studies that 1) focused explicitly on ways to embed cooperative learning elements into play and 2) moved the game-based environment

beyond the desktop. To distinguish between Alternate Reality Games (ARGs) and "augmented reality games," consider that ARGs seek to weave players' real lives and every day technologies seamlessly into an immersive game-based narrative (e.g., the Sherlock Holmes' example from Chapter 1, in which Watson sends players a text message with GPS coordinates to the next clue, which the players find, decode and email to Holmes to continue the story). In contrast, augmented reality games make use of technologies that overlay digital data onto a player's experience of reality (e.g., pop-up pins that highlight air quality indices in various locations on a smart phone location-aware map application). Augmented reality technologies can be used within an ARG to enhance the immersive experience of game-play; however, ARGs do not rely on augmented reality technologies in their design or play. For example, the Sherlock Holmes' ARG might use an augmented app's air quality indices to determine the amount of fog at the GPS coordinates they must visit (in case a player challenge demands they only go under cover of fog), but the augmented data is not required.

Both augmented and alternate reality games remove traditional videogame requirements to remain tethered to a desktop or to invest in specialized tools necessary in virtual environments. As noted above, augmented reality technologies can be used within an ARG to enhance the immersive experience of game-play; however, ARGs do not rely on augmented reality effects in their design or play. As "real-world" collaborative sense-making systems, ARGs can take advantage of relatively low-cost social media technologies and tools, such as online community wikis, forums, and blogs. The *AGOG* design team sought to extend Klopfer et al.'s

(2005) collaborative learning focus on augmented reality games by investigating the effects of integrating cooperative learning constructs into ARGs.

4.2.2 Essential Elements of Cooperative Learning

Cooperative learning, the strategic use of small groups working together to accomplish shared learning goals while maximizing individual learning, has been shown to be a highly effective instructional practice for over 40 years (Johnson & Johnson, 2009). Although diversity in cooperative learning methods exists – between eight and ten variations have been applied and studied since the 1970s – all of the methods have been found to produce higher achievement than competitive or individualistic learning approaches (Johnson & Johnson, 2009; Slavin, 1991). Improved academic performance is not the only indicator of the effectiveness of cooperative learning, however: improved psychological health, self esteem, and task-oriented and personal social support have been consistently confirmed as well (e.g., Johnson & Johnson, 2009; Slavin, 1991). As a repertoire of successful learning techniques, cooperative learning offers an useful set of conditions that can "translate into design principles for good games" (Gee, 2008, p. 37).

Cooperative learning approaches require group members to take responsibility for specific aspects of interdependent tasks (*positive interdependence*), and to promote each other's successes as they work toward the group's shared goals (*promotive interaction*). These techniques offer ARGs a means to ensure interdependency among the game's interactive puzzles while allowing players to contribute as themselves, based on a combination of their personal interests and their

ARG community's needs. This is a balance that could be explored through design interventions in both narrative and game mechanics.

4.3 Embedded Case: Cooperative Learning in AGOG

Building from the core characteristic of ARGs as collaborative sense-making systems, the *AGOG* puppetmasters sought to integrate elements of effective cooperative learning environments, such as positive interdependence and promotive interaction (Table 4.1), into the game design. The *AGOG* mythology below elaborates upon the snapshot of the narrative given in Chapter 1.

To inform the discussion on the overall educational design of *AGOG*, I touch on the concept of counterfactual thinking and its potential for promoting critical and creative thinking practice. Counterfactual thinking and design has been addressed elsewhere (Bonsignore et al., 2012; Kraus, Forthcoming), and will also be discussed in the Findings chapter. Collaborative learning and the use of cooperative learning techniques is the focus for this embedded case, and is tied directly to my goal to understand ARG design through the lens of curricular design.

4.3.1 The AGOG Mythology

The *Arcane Gallery of Gadgetry*'s mythology is grounded in the history of the U. S. Patent Office, which once inhabited a Washington, DC building. Today, that building houses the Smithsonian American Art Museum. From 1836 to 1932, the Patent Office building was dubbed a "Temple of Invention", as thousands of patents were submitted, thousands of miniature models of the designs were put on display, and thousands of visitors came to view first-hand the ingenuity of their fellow citizens (Robertson, 2006). A number of historically significant figures were associated with

the Patent Office, including Abraham Lincoln, Walt Whitman, and Clara Barton. During the American Civil War, it served as a makeshift barracks and hospital, and President Lincoln's second inaugural ball was held there. In 1877, a fire damaged over 100,000 patent models stored there (Robertson, 2006). The fire, whose cause has never been completely resolved, provided the *AGOG* designers with the means to traverse fiction and reality: this gap in historical knowledge could be used to create counterfactual paths, filled with documents, inventions, and personalities that players would have to investigate and resolve.

Throughout the design process of *AGOG*, the design team applied the notion of creating designed experiences, rather than content-delivery vehicles (Squire, 2006). The goal was to have students view historical events and artifacts as possibility spaces that can be actively interpreted and reconstructed, not inevitabilities that could simply be memorized and retold. One design goal for building the historically grounded mythology of *AGOG* was to enable students to discover "fault lines*"* (R. Byrne, 2007) that exist in extant historical records, such as the 1877 Patent Office fire. Fault lines in reality are characteristics of situations or objects that people perceive as changeable, such that alternatives are more easily perceived or imagined (R. Byrne, 2007; R. M. J. Byrne, 2002). For instance, newspapers that covered the 1877 Patent Office fire reported that its cause was uncertain. What if it was not an accident, but a deliberate attempt to destroy specific patent models – or to conveniently cover up their disappearance? What if Walt Whitman was not "just" a poet and former patent clerk, but used his duties in the Patent Office to conceal his stewardship over more mysterious, unknown artifacts? We used such gaps in events

and ideas to focus students' attention on unanswered questions, or questions open to interpretation (e.g., What might have caused the Patent Office fire? How do you track and restore lost records? How do ideas get patented?). In this way, we sought to subtly foster student engagement with the *National Center for History's Historical Thinking Skills (Lesh, 2011, p. 17)*, such as

- "*Differentiating between historical facts and historical interpretations*,"
- "*Challenging arguments of historical inevitability,*"
- "*Identifying the temporal structure of a historical narrative or story*" and
- "*Comparing/contrasting differing sets of ideas, values, personalities, behaviors, and institutions.*"

Another primary design goal was to find ways that would not only encourage the collaboration typically experienced in ARGs, but also provoke interdependencies among players so that they would distribute team tasks more equally among themselves. To ensure that no one player could collect and reconstruct all the information required in the game timeframe, we distributed story content across multiple media types and tools, and embedded interdependent puzzle components within these story fragments. Historic maps contained over a hundred locations and landmarks into which we embedded several clues; several cryptographic key phrases were split across historic documents; a simple telegraph had to be reconstructed and tested; and archival data had to be evaluated to solve a logic puzzle about historical figures that were part of the game's narrative.

4.3.2 Participants and Review of Methodology

AGOG took place over a 2-week period in a public school in the U.S. Sixty 8th graders started the ARG, with about 55 students (13-15 years old) participating consistently. The students played during their American History class sessions (50 minutes each). To accommodate computer lab scheduling and to facilitate classroom management, the students remained in their respective class sessions (27 students in one class, 33 in the other), with only one instance of the game being played across both groups. One week before the game, the students received background on ARGs, and parental consent forms were distributed. Fewer boys participated than girls: 44% boys (26), 56% girls (34); half the students were eligible for the school's free and reduced meal program; and six percent had limited English proficiency (LEP). Regarding ethnicity, 43% (26) of the students identified themselves as African American, 37% (22) as Caucasian, 13% (8) as Hispanic, one as Asian American, and three as mixed race. A teacher and school librarian worked with the *AGOG* research team throughout the game.

As noted in Chapter 3, a multi-method case study framework (Yin, 2003) was used. The main case involves the design and effects of AGOG in a formal education setting. The embedded unit of analysis for this case focused on student collaboration. Data across several levels of student participation were collected:

- Observation and field notes on all in-class sessions,
- Brief daily summary meetings among the researchers and teacher;
- Online, print, and physical artifacts created by students and in-game characters as part of *AGOG*; and
- A post-game survey and discussion with students.

Table 4.1: Elements of Cooperative Learning mapped to *AGOG* design features.

Essential elements of Cooperative Learning	How each was designed into *AGOG*
Individual Accountability Individual performance is assessed and shared with both the individual and group. Individuals are held responsible for contributing to the group success.	Each student was required to complete a series of increasingly complex problem-solving missions to become certified in a specific Order. Badges were awarded and posted on individual member profiles for each mission completed.
Positive Interdependence Group members believe they are linked with each other so that the success of one depends on the success of all (and vice versa).	Members from each JENIUS Order had to solve individual clues that, taken together, form the end-game solution.
Promotive Interaction Individuals encourage each other's efforts to achieve the group goals by sharing resources and providing positive, constructive feedback to each other.	Students were encouraged to share information via the community chat feature, blogs and wiki, as well as on the "big-paper" posted on a community "wall of evidence" in the lab (**Figure 1a-1b**).
Group Processing (and associated *constructive controversies*) Groups periodically reflect on how well they are functioning and how they may improve their processes. These sessions often reveal intellectual controversies, which, when managed constructively, can promote active searches for more information, and a reconceptualization of knowledge/reasoning.	Daily whole group "circle time" was built into the beginning of class to discuss individual mission status and to review plot updates. During class, researchers worked with small groups. An extensive session was held midway through the game, just before the final community mission was revealed to players.

The analysis goal was to craft a design-based account of the students' interactions with *AGOG,* focusing on collaborative interactions. Any findings would be used to develop design-based theories about the integration of cooperative learning techniques into immersive learning experiences like ARGs (cf. Barab et al., 2007; Hoadley, 2002). The essential elements of cooperative learning (Table 4.1, Johnson et al., 1994) formed an initial coding frame. Supported by feedback from other members of the research team throughout my coding process, I used the following constant comparison steps for analysis: each data source (e.g., chat interactions) was analyzed as a single reference; then coding comparisons were made across sources (e.g., survey responses, blog posts, chat interactions).

4.3.3 Implementing the Game

The game began when the students were recruited by the research team (acting as "university researchers") to help inspect a set of historical artifacts that had allegedly been discovered by staff members from the Smithsonian American Art Museum. After receiving background on the *Junto*, an actual but secret philanthropic society established by one of America's founding fathers (Benjamin Franklin), the students accepted an invitation to be part of a modern version of the *Junto*, called *JENIUS* (*Junto of Enlightened Naturalists and Inventors for a United Society).* They discovered that *JENIUS* is an underground extension of the original *Junto*, and that its purpose is to curate a special subset of covert Patent Office designs known as the *Arcane Gallery of Gadgetry*. Most of the game's narrative content and missions were presented and stored across two websites: a "rabbit hole" public site and a password-protected private community site. All students could see each other's work, both online and on a working "wall of evidence" on which students and researchers posted ongoing questions, ideas, and findings (Figures 4.1 & 4.4).

JENIUS membership is distributed across four Orders, or community sub-groups. Each Order provides a different, but interrelated function: *archivists* are responsible for determining the authenticity of documents and artifacts, tracking their provenance, and maintaining accurate records about both the society and its artifacts; *cryptographers* are responsible for ensuring the security of *JENIUS* artifacts, through their knowledge of codes and ciphers; *inventors* are responsible for maintaining and extending existing *JENIUS* artifacts, as well as creating new designs; and *surveyors* are responsible for maintaining the society's maps and charts, along with other location-based data, such as the geographic coordinates of *JENIUS* documents and

artifacts that must remain distributed to ensure they do not fall into unsuspecting, non-*JENIUS* hands. *JENIUS* Orders provided the game-based means for students to band into interdependent groups. Students self-selected into Orders, based on an online "Orders Quiz" developed to help them decide which specialization was the best fit.

The game was staged in two phases: a training phase and the final mission. During training, students worked to acquire various Order skills, such as using geographic tools like gazetteers and Google Maps™ (surveyors), searching patent and biographical databases (archivists), making an electric circuit (inventors), and learning about cryptographic keys, Morse code, and encryption using mono- and poly-alphabetic substitution (cryptographers). Students earned badges for every mission they completed, and a final certification badge when they completed all three missions for a specific Order. Badges for completed missions were posted on their profile pages. The training phase was intended to promote collaboration within groups and emphasize individual accountability (public posting of badges, encouraging and helping fellow Order members).

The *JENIUS* students' final mission required the skills of members from each Order, and entailed decoding, decrypting, and reassembling a message that had been scattered across documents they were uncovering through their research. Surveyors pinpointed the locations of clues, cryptographers decrypted the clues, archivists validated and reassembled the contents of the decrypted message, and inventors repaired a notional telegraph and created a Morse-encoded recording of the

Figure 4.1: The *AGOG* Players' *Working Wall* of Evidence.
Players and facilitators annotated and added notes to "Big Paper" with print versions of maps, blog posts, images, and cryptograms. Players added data about clues found, theories, ideas, and questions.

message. This allowed the students to help a fictional in-game character with whom they were working to send the final message back in time to a previous *JENIUS* leader, who used it to prevent a dangerous rift in the course of history.

Figures 4.2 and 4.3 offer insight into the puppetmaster design process. Figure 4.2 shows an initial brainstorming mind-map sketched by one of the *AGOG* design team members. The square in the center of the diagram represents the message that must be reassembled and sent back in time. The surrounding squares represent the clues that the students would need in order to complete their mission. The connecting lines, or graph edges, represent the links between clues. Figure 4.3 corresponds to the

original sketch, but shows facsimiles of the actual documents, clues, and artifacts that the students used, rather than sketches of the objects (e.g., two maps, a message shell with blanks and encrypted text, documents that contain cipher keys). Each set of clues are clustered with the documents that were associated with the JENIUS Orders that were responsible for uncovering the mysteries behind the documents or the artifact (e.g., understanding how to use a cipher key; fixing the facsimile of telegraph).

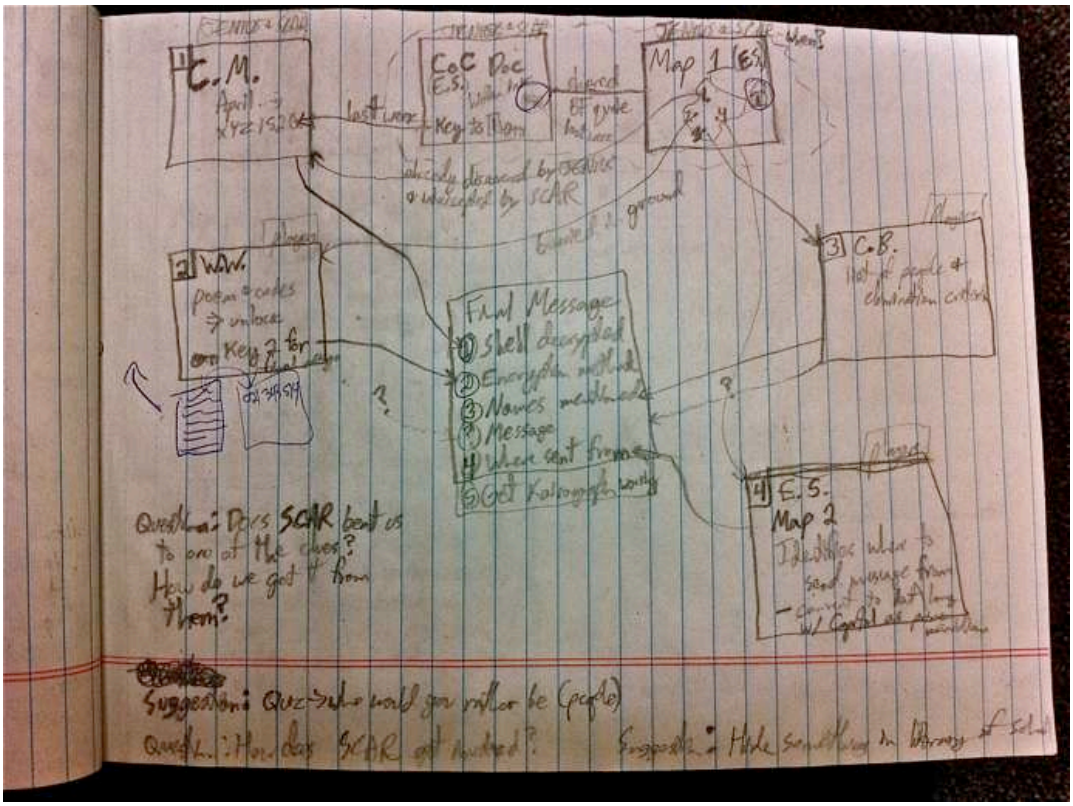


Figure 4.2: AGOG Final Mission Design, Initial Brainstorming Mind-Map.

Consider Figures 4.2 and 4.3 to be the *AGOG* puppetmasters' cooperative learning-based design equivalents to the design documents from The Beast (Chapter 2, Figure 2.1) and MetaCortechs (Figure 2.3). To encourage positive interdependence across the Orders, each of the individual clues was itself a logic puzzle or encrypted/encoded document that required the skills of a specific Order. For example, one document contained a logic puzzle that required the information gathering skills

of archivists to confirm a list of historic figures who were potential *JENIUS* enemies. Other documents represented key/cipher pairs that required students first to recognize what they had, then to connect the right pair together, and finally to reach a solution. For instance, one document, an inventory list, was actually a key that could be used to find the locations of important clues. Its document mate, a historic map, contained a legend with numbers linked to locations in downtown DC. When the two documents were paired, the map legend became a lookup table for the key numbers, and the students could winnow almost a hundred possible clue locations down to four.

Figure 4.3. *AGOG* Final Mission Design Document, mapping game artifacts to individual Order clues/challenges.

The game narrative was shared with students via two in-game characters: the *JENIUS* Ambassador and April Gravure. The fictional *JENIUS* Ambassador, a mysterious, omniscient leader in the society, provided information to players at key, pre-scripted

stages in the game narrative (e.g., Introduction to *JENIUS*; Final Mission Orders; end-game congratulations). April was a fictional 21-year old college student who needed the students' help to send the message that would successfully end the game. April was the game's "*protagonist-by-proxy*", i.e., the character who seems to discover the story in tandem with the players (Anderson, 2008). As a *protagonist-by-proxy* who helped give clues and cheered players as they worked through their training missions, April represented a narrative-based keystone species in the *AGOG* information ecology (Chapter 2, *section 2.3.4*). The in-game characters of April and the Ambassador were not avatars: members of the *AGOG* design team played them.

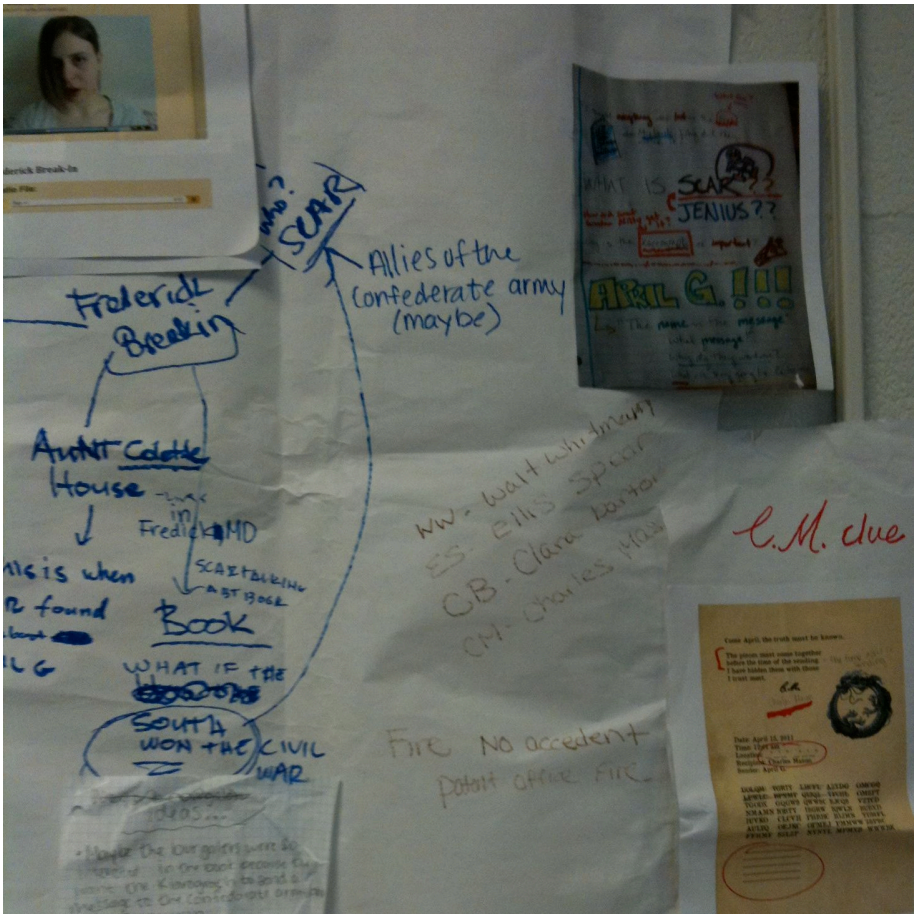


Figure 4.4: More student player notes from the *AGOG Working Wall* of Evidence. Students taped, stapled or wrote notes directly onto the "big paper" that made up the Wall.

The *AGOG* team used the following media channels to deliver story fragments over the course of the game:

- *Videos* and *text-/image-based blog posts* were used by April G. to reveal secrets about the *JENIUS* Academy and clues to the final mission, as the students advanced through the game.
- *Podcasts* were the only communications used by the *JENIUS* Ambassador. As a stereotypical authority figure, his communications were one-way only; he did not engage in dialogue with the students.
- *Facebook-like Status Wall* updates were used by April as an informal, live *chat* mechanism, to give students encouragement and help as they worked through their missions. These updates were visible to all students, and posted in a prominent place on the *JENIUS* community website.
- *Incomplete Wiki entries* were seeded on the *JENIUS* website, providing hints and clues. The community wiki also included copies of *JENIUS* documents (e.g., historic maps, community ledgers) and images of artifacts (e.g., the Kairograph, an *AGOG* invention fashioned after the telegraph). April created some of the wiki entries, modeling ways to compose informative archival documents and accurate geographic data.

The students could use any of these media during game-play. For example, in their first mission, all the students created and posted videos of themselves taking the same "oath" to scientific and moral inquiry that Benjamin Franklin's original *Junto* members used. Throughout the game, they also used the Status Wall updates to chat with April and each other, and created blog posts and edited wiki entries to complete

missions and share information with their classmates. The design team, participating as fellow *JENIUS* members with the students, also used these media to help point players toward clues, and to model information literacy practices.

At the beginning of class sessions each day, students and designer/facilitators would gather as a community to summarize events and activities of the day before, and introduce new plot points (usually via videos/blog posts by April G. or podcasts from the Ambassador). Students could ask for help or share information during these group processing sessions (Table 4.1), which lasted anywhere from 10-15 minutes. Just before the final mission, and also in the post-game debrief, the design team allotted extra group processing time for the students to share burning questions or concerns that they had (~30 minutes). Throughout the game, students also posted any questions, concerns, or evidence they felt they should share with the community on "big paper" that became their "wall of evidence" (Figures 4.1-4.2).

4.3.4 How did the Players Collaborate?

Table 4.1 summarizes the cooperative learning elements that we sought to design into *AGOG*. Key examples of the ways in which the design team observed these elements emerge during game-play are detailed below. This section provides evidence of the target behaviors that cooperative learning structures promote, such as providing mutual support when difficulties are encountered, awareness of one's interdependence with the larger community, sharing resources, and celebrating individual and joint successes. All student names are pseudonyms[17].

[17] All student player names are pseudonyms, per University Institution Review Board policy on research with human subjects (specifically, with minors under 18 years old).

Individual Accountability. The training mission format worked well to support individual accountability. Training missions allowed the team to embed content-based

TimV. I Got A BADGE! (:
Edit Delete View conversation
Ben05 just gd with mission 1. man thats hard. i felt like a fail
Edit Delete View conversation
Ben05 but feel like a boy scout when i get a badge. so proud of myself.
Edit Delete View conversation
Tina05 >> April G. HEY APRIL :) I finished my second mission ;)
Edit Delete View conversation
April G. >> Monique Hey Monique! Saw on your profile that you like taking pictures and drawing. That's Awesome! ... wish I could draw.
Edit Delete View conversation
Monique >> April G. tx nd wat do u like to do?
Edit Delete View conversation
Annette >> Malika How do you get to da quiz
Edit Delete View conversation
Sarah. I feel like a spy on a mission.
Edit Delete View conversation
Malika >> Annette Go under Training it says Order quiz
Edit Delete View conversation
Ben05 Who is a cryptoghrapher? I NEED UR HELP!
Edit Delete View conversation
April G. >> Austin You could always read up on the wiki pages I posted or solve some other Order Challenges (even if they're not for inventors)
Edit Delete View conversation
Austin >> April G. Yeah. I have been blazing through my inventor training. :-)
Edit Delete View conversation

Figure 4.5: Sample Status Wall Updates (Students to each other and April).

and information literacy lessons into the game in an authentic way, and enabled individual assessment and feedback. All students were very proud of their badge accomplishments, as evidenced by their Status Wall updates to each other and April (Figure 4.3). In the post-game survey, almost half of the students noted that the missions and badges were the most fun, challenging, or surprising aspects of *AGOG*; of these, 20% mentioned that the missions were both challenging *and* fun. One student let his colleagues know how he was doing in training via this short blog post:

> ***Anton:*** *Whewww!!! Just finished two of the missions of cryptographer. Very happy {kinda gettin into this game}* (Update sent on Day 4).

Another student shared both her frustration and success with April via chat as she decrypted an excerpt from the 14th Amendment, on due process (an American History content requirement):

> ***Myra****: … i Got A 67% i Dont Get It (Update sent at the start of a class session, Day 3).*
>
> ***April G:*** *Hey, that's not bad, though—you're almost there. Ask the JENIUS people for help on that last question.*
>
> ***Myra >> April G****: i Got 100% (: (Update sent to April, toward the end of the class session, Day 3).*

April G: *100% --That's cool! You get a new badge!!! :)*

Myra: *I Know, Right*

Positive Interdependence was most visible across groups during the final mission, because the interdependence of the Order tasks was strong (e.g., cryptographers decrypt a clue that surveyors pinpoint as the next clue's location). One student captured her analysis of *AGOG's* increasingly interlocking parts as follows: "*There were 3 [missions] you played and then a master level that you have to use the skills you learned from the first 3. The last level is a group level where you put all of your skills together.*" The "wall of evidence" proved particularly useful for students during daily group discussions. The wall served as a forum for each Order to present their own discoveries to the group. For example, students visually saw connections between artifacts that each Order was working on (e.g., the Ouroboros symbol imprinted on an historic map the surveyors were using was the same as one on an historic document the archivists and cryptographers were studying). Because many students physically sat close to others in their same Order, connections between Orders sometimes had to be facilitated by design team members who would overhear one Order member saying things relevant to another Order's current problem (e.g., two Orders each trying to figure out why they had only half of a quote from Ben Franklin, but not realizing the other Order had the other half).

Cross-Order collaboration also occurred online, as students created blog posts to share information, or posted status updates asking for help from members outside their own Orders. A few students logged in from home, or otherwise outside of their regular class sessions, to send status updates to each other. For example:

> ***Ben05****: Who is a cryptoghrapher? I NEED UR HELP!* (Update sent on Day 5, decoding April's notebook.)
>
> ***Ginny >> Claire746****: hey i have to tell you some stuff i have found out about the clues* (Update sent over the weekend.)
>
> ***Claire746****: haha…im going solo! im trying to figure other things that i dont even know… can someone help? Surveyors!!!! helpp!!!!!* (Update sent over the weekend, after she had decoded a critical clue and wanted to do more before class the following Monday/Day 7.)

Individual accountability and positive interdependence *within* groups was more problematic due to the Order self-selection process coupled with the individual-only (versus group) badge awards. Students could choose their JENIUS Orders because 1) in most ARGs, players self-organize into teams based on skills they feel they can contribute, and 2) the design team wanted the students to identify personally with their Order. To encourage the formation of informal, interrelated sub-groups *within* Orders, participating members of the design team encouraged students who had completed missions quickly to work with members of their Order who were struggling. This worked well in one class, because the distribution of students across Orders was fairly even (7 archivists, 7 cryptographers, 6 inventors, 7 surveyors). In the other class, an overwhelming number chose to be cryptographers (17), and only one was a surveyor. Consequently, training could be difficult to manage since students worked at different paces, and several students did not feel accountable to earn badges for their Order.

Promotive interaction, in which students share resources and highlight each other's success, appeared strongest during the final mission. During the training phase, in-game characters modeled promotive interaction for students. For example, April posted encouraging status updates (Figure 4.3) and videos, the Ambassador congratulated students on their progress in his podcasts, and participating members of

the research team encouraged students. By the final mission, students were engaging in their own promotive interaction efforts, as shown in the Status updates (with Ben05, Ginny, and Claire746, above) and in the blog posts shown below (by Ben05 and Claire746). In the post-game survey, over half the students commented that they had to "work together and share information" to complete the game.

The stories of *Ben05* and *Claire746* offer evidence for both positive interdependence and promotive interaction. Early in the game, the social studies teacher and librarian relayed to me that *Claire746* typically did not participate much in class, yet her blog posts, status updates, badge certifications and efforts in class to find and decrypt clues tell a different story. In her post-game survey, she shared that she enjoyed "*how real [the game] felt*" and that the most fun and challenging part to her was "*When we felt like a detective figuring out things.*" During the final mission, she posted several blogs to share information she had found with her classmates. Here's one that also reflected her knowledge about navigating and working with the media on the site:

> **Claire746:** *If you go under collaborate-->wiki-->unsolved questions-->message to charles mason (CM) to see the message… or to -->cabinet of curiousities document to find the hidden key phase: "YOU DELAY BUT TIME WILL NOT." i dont know what "A PLACE FOR EVERYTHNG" means… can anybody help?* (Blog post on Day 7.)

Ben05, another quiet student, initially shared his frustration at the difficulty of his first mission and his elation at finally completing it (**Figure 4.3**). By the final mission, he was one of the game's most prolific bloggers:

> **Ben05***: As you know, last week we observed April G's notes on her phone recording. The morse code translated out to be: Messages Across Time. This is obviously linked to the Kairograph, which can send messages in the past, present, and future. SCAR is obviously on the hunt for this. We need April to write that message on the 15th!!!!! We need to work together for*

> *clues & find why SCAR wants April. You can talk to me about my blog at Ben05* (Blog post on Day 5).
>
> **Ben05***: Me and Anton just got done decoding Walt Whitman message. It states: Time Lost is never found again. This is obviously leading to something, but what? We need more clues!!!!!!!!!* (Blog post on Day 7.)

Group processing. Questions about TINAG dominated interactions between the design team and the players during group processing discussions, highlighting the responsibility that educators have to balance the drama of uncovering new nuggets of history with the academic imperative to remain trustworthy models (Visconti, 2011a, 2011b). Still, these TINAG talks also gave players an opportunity to debate and share insights with their peers. One student related *AGOG's* mechanics to the interlocking layers of fiction and reality in the film *Inception,* while another explained to her classmates that what they were doing was "*imaginary real*." Yet another suggested that some of the information they were working with was "like beliefs" (i.e., opinions, and not always factual or grounded in evidence). The design team viewed the community TINAG discussions as opportunities for *constructive controversy* (D. Johnson et al., 1994), not as conflicts to be avoided or suppressed. As described by Johnson et al. (1994), constructively managed conflicts promote: "an active search for more information, a reconceptualization of one's knowledge and conclusions, and, consequently…higher-level reasoning strategies" (p. 29).

Design considerations and recommendations that emerged from my analysis, which was focused on highlighting evidence of collaboration among players, include:

- To help foster positive interdependence and accountability within groups (Orders), the *AGOG* team – and designers of future ARGs like *AGOG* – should consider incorporating at least one training mission that requires two to

three players to work together, with opportunities to earn Order-level badges (i.e., each member receives both an individual and "team" award for completing a training mission).

- To help students get a sense that their individual training efforts will contribute to the overall story and final community mission, the *AGOG* team should consider alternatives for including more narrative information from in-game characters during the training phase.

4.4 Tailoring ARG Features for Teen Audiences

In this section, I transition from a more focused look at the embedded case of collaboration to consider the ways in which the *AGOG* team tailored key characteristics of ARGs (transmedia interface, participatory narrative, and authenticity) for teen audiences in a formal learning context (Bonsignore, Hansen, et al., 2013). Figure 4.4 provides an overview of the ARG characteristics that the *AGOG* team used to guide design decisions and to evaluate game play. These characteristics were derived from the interaction design features of ARGs presented in Chapter 2.

4.4.1 Design Strategies

Note that some of the design strategies outlined in the following sections support more than one design principle. For instance, the variety of media that the design team used to deliver *AGOG's* story content gave players the sense of a transmedia interface as well as a means to participate in the unfolding story.

4.4.1.1 Transmedia Interface

The *AGOG* story world was implemented across two websites: a "rabbit hole" public site and an in-game password-protected site. Both websites used the Drupal

Table 4.2: Comparing ARG features to most traditional videogames

Traditional videogames	Alternate Reality Games (ARGs)
Integrated Participatory Narrative	
• Story provides context • Often shown as "Cut Scenes", with little live interaction • Digitally rendered story world • Challenges are usually external to narrative content (i.e., an iterative cycle of: complete challenges then see story, complete challenges, then see story, etc.)	• The story *is* the game (interactive, malleable story elements) • Participatory: Players contribute story interpretations • Blended, hybrid story world (physical and digital elements) • Challenges are embedded within, and integral to the story elements (e.g., email address, encoded chat message, or clue in narrative content)
Pervasive, Transmedia Interface	
• Require Controllers (e.g., mouse, joystick) • Single platform or interface • Governed by computational rules	• "Everyday" communications tools (e.g., email, chat) • Distributed across media/*Transmedia* (e.g., video, text) • Influenced by player collaboration, and community
Authenticity (TINAG)	
• Players play as avatar (or game token) • "Magic Circle" of play [19, 28] is bound by a digital interface of physical game board, with player avatars or game tokens	• Players play as themselves • Players adhere to the "This is Not a Game" mindset (TINAG), whereby they suspend disbelief to participate in authentic ways, as themselves, not avatars

content management system (CMS), with tailored modules that included video/audio recording and publishing tools, chat & instant messaging, geographic and timeline tools, simple assessment tools with a quiz-like format, a badge award system (for successful completion of tasks), and a wiki. Although *AGOG* relied on fewer sites than most ARGs, the design goal was for the variety of media used within those sites to ensure they were still rich, interactive transmedia experience.

A private, password-protected community site was an important design consideration for teenage participants, based on school requirements to have a safe workspace in which players could collaborate without concern that unknown outside entities might distract players ("Children's Internet Protection Act," 2011). Creating a private player community site also holds potential advantages in terms of reuse (Hansen et al., 2013), since game data can be reset for each class or group that might

want to experience the ARG. Reuse is especially important in education settings, given the time required to develop and tailor new lessons for different classes.

4.4.1.2 Participatory Narrative

To address the creation of a participatory narrative, the *AGOG* design team needed to 1) create a hybrid and immersive story world that 2) required player participation to unfold.

4.4.1.2.1 Blended, hybrid story world

In addition to addressing privacy concerns, *AGOG's* two-site format could accomplish two things in terms of narrative delivery and authenticity. First, the public site could provide players with actual historical background on the real *Junto* and its principles. Second, when the players entered a secret phrase about the *Junto* from the public site, they would be redirected to the password-protected community site. The division of the two sites offered a design-based means to signal factual information from potentially suspect information to the players. The public site was designed using a Drupal module, *Konami Code*, which is based on the use of cheat codes in videogames that can reveal special information to players (Loach, 2009). The secret phrase was an anagram of the URL of the public site (*justnoevil*.org) that implied the historical *Junto* was still active ("*Junto Lives*"). The anagram was a play-based means to lead players into discussions about patterns and codes, as an entrée to the cryptographic missions that some of them would complete during the game.

As detailed in section 4.3.3, April Gravure and the *JENIUS* Ambassador served as the in-game characters who would deliver the *AGOG* narrative to players. They represent two different types of keystone species that can be effective tools for scaffolding players' appropriation and practice of new media literacy skills. The

JENIUS Ambassador served as a *protagonist-mentor*, a more authoritative character who provides guidance on the overall game objectives (e.g., embark on training missions to help April successfully send a message to past *JENIUS* members). April served as the players *protagonist-by-proxy*. In addition to these narrative-centric keystone species that immersed players in the *AGOG* story world, the design team also used a variety of media to give players a sense that the story was indeed a fragmented mystery that April needed help in piecing together. Although the players interacted primarily though the *JENIUS* community website, the way in which the narrative was distributed across multiple media helped give players a sense of immersion. Each media type served a different purpose and was delivered to players at different times, to ensure that players worked across a large variety of transmedia as they worked through the story. The media types were summarized in *section 4.3.3* and include elements like podcasts (by the *JENIUS* Ambassador), video (particularly video posts by April), and incomplete wiki entries that could be appended and revised by players. Importantly, players could use any of the media during gameplay to interact with the storyline.

4.4.1.2.2 Player Participation

The multimedia that the *AGOG* team used supported player interaction with the game narrative as it unfolded, but the team also wanted to encourage active player participation. The team carefully structured the player community and scaffolded game progression to facilitate player interaction (and collaboration, as already shown).

Designing for individual player and community participation. As detailed in *section 4.3.3*, to encourage players to collaborate as they reconstructed the

fragmented narrative to complete the game, the *AGOG* team embedded interdependent puzzle components within the game site's distributed narrative content. Historic maps contained over a hundred landmarks into which clues were embedded; cryptographic key phrases were split across historic documents; and archival data had to be evaluated to solve a logic puzzle about historical persona. In addition, the team wanted to help *each* teen player feel as though s/he was a contributing member of the *JENIUS* community. Thus, as detailed in *section 4.3.3*, collaboration and individual accountability were important factors in terms of player participation, and the four "Orders," or community sub-groups, within *JENIUS* afforded both. *JENIUS* Orders provided a game-based means for students to band into interdependent groups.

Designing for scaffolded game progression and incremental player participation. In most ARGs targeted for adults, player communities share information about skills they already possess that may be used to tackle puzzles and codes that are embedded in the narrative (A. Martin et al., 2006). A musician may find a clue embedded within a music file, a web designer may extract a code from source files in a website, or a videographer may help another player create a video segment in response to an ARG challenge. In *AGOG*, the middle school players had little to no experience with uploading videos, encoding Morse code, decoding simple substitution ciphers, or using GPS coordinates to find locations on maps. Yet all of these skills would be needed to complete the final mission.

Although I touched on the missions and skillsets associated with each order in *section 4.3.3*, I emphasize the design again here from the perspective of the *AGOG*

team's goal to ensure that players experienced scaffolded game progression as they worked through the game challenges and engaged in information literacy practices such as gathering and managing information and problem-solving (Bonsignore, Hansen, et al., 2013). Based on expert interviews and the ages of the teen players, the *AGOG* team wanted to ensure that players had opportunities to practice the skills that they would need for the final collaborative puzzle. Two phases were designed into the game progression to address this challenge: a *training* phase and the *final* mission. Training missions were designed to help players to acquire various Order skills, such as using geographic tools like gazetteers and Google Maps™ (Surveyors), searching patent and biographical databases (Archivists), making an electronic circuit (Inventors), and learning about cryptographic keys, Morse code, and substitution ciphers (Cryptographers). Missions were designed so that players could earn badges for each mission they completed. Again, each mission was designed for *scaffolded progression* into higher levels of skill for a particular order. For example, *AGOG* players who self-selected as Surveyors would first complete a mission on latitude and longitude, then use their knowledge of latitude and longitude to locate specific landmarks on historic maps, then transfer these same skills to identify similar landmarks on modern maps. Likewise, Cryptographers first learned about the process of encoding with a Morse code mission, then explored the concept of *keys,* and how different types of keys were used for encryption and encoding before moving on to learning to use a cipher wheel for more complex polyalphabetic substitution ciphers. The goal of the training phase was to promote collaboration *within* Orders and emphasize *individual* accountability (Bonsignore, Hansen, Kraus, Ahn, et al., 2012).

Several of the missions were mapped to academic content standards for the middle school level (e.g., geography skills/understanding maps, recognizing patterns in codes/math, and finding and evaluating information).

Again, the final mission was designed to *support collaboration and information sharing among* groups, as it required players to use the skills of members from each Order. It entailed decoding, decrypting, and reassembling a message that had been scattered across documents in the wiki and presented by April and the *JENIUS* Ambassador. The endgame goal was to ensure that the players could complete the game successfully only by collaborating across Orders and applying the individual skills acquired during training.

4.4.1.3 Authenticity

As noted throughout this dissertation, TINAG presents opportunities for players to take part in an authentic narrative, which can be highly engaging and offer personally meaningful learning opportunities (G. Martin, 2010; McGonigal, 2003b, 2011). At the same time, denying that the experience is a game may be seen as an attempt to misrepresent the truth to players, especially if they are young. Writers of historical fiction face similar challenges in addressing the tension between staying true to the historical record while presenting counterfactual, but plausible scenarios that can engage audiences who might not consider history to be interesting (like teens).

The *AGOG* team's TINAG design goal was to maintain an immersive experience while supporting player efforts to separate fact from fiction (Bonsignore, Kraus, Visconti, Hansen, et al., 2012a; Visconti, 2011b). The team tried to scaffold the play context (in-game website and player discussions) with subtle visual markers

to support player efforts to make sense of the fact/fiction divide. In blog posts, a change in fonts (e.g., regular to *italic*) was one visual marker used to signal a move from fact to fiction. When historical information on the community wiki was purely fact, it was hyperlinked to credible sources. For story elements that were questionable and required investigation by players, wiki text posed questions, such as "*Cause: unknown?*" When players read about real historical figures with a fictional, game-based secret identity, the data was divided into two sections: "*public*" reflected known, publicly available data, and "*private*" or "secret" reflected fictional aspects of these entities.

In addition, the Orders offered players the opportunity to assume roles in which they had a personal interest. This was not only an important design decision in terms of authenticity, it was also an important consideration for teens, who are just beginning to explore and reflect on their identities (Huffaker & Calvert, 2006; Poole & Peyton, 2013). As touched on in *section 4.3.3*, to help the players decide which Order might be the best fit for them, the *AGOG* creative writer created an "Orders Quiz." The Quiz posed questions such as: "*You're an explorer setting out for uncharted territories. You can take only one of the following things. What do you take?*" The choices listed for each question related to the dispositions of members of each Order (e.g., "*A pocket knife. I'll think of a million ways to use it*" or "*A compass. I need to know where I'm going*"). The *AGOG* team's goals were to help players feel 1) that they had a choice, and 2) that they could personally identify with the Order they chose.

4.4.2 Gameplay

This section adds to the observed effects of players' collaboration (*section 4.3.3*), by including additional evidence of player participation based on the ARG features of transmedia interface, participatory narrative, and authenticity.

4.4.2.1 Gameplay: Transmedia Interface

Although the *AGOG* "transmedia" interface was a single private community site rather than a more multi-sited network, players interacted with every type of media we used within that site. Based on analysis of databased traces of online player activity, field notes from observations in the classroom, and the player post-game survey, the multimedia distribution of the *AGOG* narrative by live characters proved to be one of the most engaging design elements for players. Students would often replay April's daily video blog posts multiple times to ensure that they uncovered all the clues that they thought might be revealed by her. Videos and audio podcasts garnered the most attention; however, it was often difficult to get players to read through any text beyond the chat-like messages on the Status Wall. This may have impacted the effectiveness of the visual markers used to highlight factual from fictional data (i.e,. the "public" versus "private" wiki entries described in *section 4.4.1.3*).

In-person (in-class) media was also an important aspect of *AGOG's* transmedia interface. Physical artifacts and objects feature prominently in almost all ARGs, and in *AGOG*, several players in the Inventor Order enjoyed working with a simple telegraph and creating LED bracelets during their training. In addition, players could post concerns, questions, or evidence that they felt should be shared with their class community on "big paper" posted at the front of the lab. As more and more

clues were posted, the big paper became a working "wall of evidence" (as detailed in in the collaboration *section, 4.3.3*). One player used the "wall of evidence" to post an idea she had pieced together about an historical event that was critical to the game (a Patent Office fire). In her post-game survey, she proudly explained how her efforts had advanced the game's progress: "*I had an idea and I wrote it down. It kinda gave a hint to the others of what April needed to do."*

4.4.2.2 Participatory Narrative

Players used the same types of media that the design team used to distribute narrative elements in order to participate in the story. Throughout the game, players used Status Wall updates to chat with April and each other. Over 1000 chat messages were logged during the game. Chat topics included players publicizing their mission accomplishments, sharing data, and exhorting their fellow players to collaborate (more samples shown in *section 4.3.3*):

> **Keara**: *"@Spence - How You Complete Mission 1?"*
>
> **Morgan**: *"@Kamry - What mission you doin? Ima do it…"*
>
> **TonyV**: *"I Got A BADGE ! (:"*

Most players felt a strong connection with their protagonist by proxy, April. Over the course of the game, April received many chat messages (almost 20% of the messages were directed to April or were April's responses to questions from players):

> **Henry**: *"Hi April, my name is Henry - these missions are hard"*
>
> **Kamry**: *"So Im Going to Need Your Help With Mission 1 of Cryptographer. Cant Quite Get the Morse Codes, Any Ideas?"*

In the post-game survey, several players commented that they felt April was a major reason they participated: "*I tapped the code for April*"; "*I helped April G*"; and "*April was in trouble and we had to help her.*" This data corroborates several ARG

designer and player assertions that players often see the protagonist by proxy as people "just like them" (M. Anderson, 2008). From a learning perspective, players may be motivated to regard these in-game protagonists as both mentors and investigative partners.

The chat feature proved a double-edged sword for teen players, as many chat messages were purely social, such as:

Jess: *"In social studies with all my friends!"*

Morgan: *"How ya doin from across dah rumm!"*

Toward the end of the game, as many players rushed to complete the Final Mission, some spent more time testing their ability to get live reactions from their peers through chat. While unsurprising from a teen social development perspective (Grinter & Palen, 2002; Huffaker & Calvert, 2006; Poole & Peyton, 2013), the *AGOG* design team decided to turn off the site's chat feature during the last 3 days of the ARG to help refocus attention on the endgame. A few players expressed their disappointment about this decision in their post-game survey. However, during gameplay, it was observed that limiting this one mode of participation seemed to help re-engage several teen players in the game activities.

4.4.2.3 Authenticity and TINAG

The players' Status Wall updates offered evidence that players were personally engaged in helping advance the narrative:

Kamry: *"Ready Start This Good Ole Mission! Feel Like Sherlock Holmes ;)"*

Ben: *"I feel like a boy scout when I get a badge… so proud"*

Claire: *"i feel like a secret agent..."*

Rachel: *"I feel like james bond…"*

In response to open-ended questions in their post-game surveys, (e.g., What did you like most?; What surprised you?) about 15% of players mentioned that they felt like detectives or spies, "*saving the past.*" One student noted that "*treating it like it was real*" was the best aspect for her, and 20% of her classmates were surprised at "*how real*" the game felt. Over 70% said they would play an ARG like this again, because it was "*fun to solve a mystery*," "*fun to help*," and "*it was a strategizing game that keeps you thinking."*

In addition to their enthusiasm at being "real-live agents" within a secret society, players had many questions about which aspects of the narrative and game puzzles were "real," and which were not (TINAG). As noted in the *Collaboration section (4.3.3),* to help players work through their questions, the design team would meet with players for *Group Processing* (D. Johnson et al., 1994) at the beginning of class sessions each day, to collectively summarize events and activities of the previous day and introduce new plot points (e.g., video post by April). Players could ask for help or share information during these group-processing sessions, which typically lasted 10-15 minutes. These group processing discussions afforded players an opportunity to debate and share insights with their peers about how to interpret and evaluate information when they were working in the "*imaginary real*" (in the words of one student). For teens learning to critically evaluate information, these discussions helped "lead to productive explorations on why and how" and "emphasize creative thinking rather than memorization" (Jenkins et al., 2006, p. 17).

There was also some evidence that players applied what they had learned during the whole group processing discussions as they evaluated data from their

Order missions. In response to an archivist mission that required research on the authenticity of specific inventions, one player posted the following blog entry:

> *"Although Eli Whitney was known for his famous invention "the Cotton gin", how can we be sure he was the first? How do we know that people such as William Bell, ... John McBride, or Obadiah Crawford hadn't invented it first? Long-staple cotton gins had existed long before Whitney's but with such an image is difficult to prove it's authenticity. It could easily be proven fake"* (AGOG student player blog entry, April, 2011).

4.5 Summary of the Chapter

In this chapter, I detailed the design process that the *AGOG* team followed to create and implement an ARG for teen players in a formal in-school context; specifically, an eighth grade social studies classroom. I first focused my analysis on the ways in which the *AGOG* team tackled the problem of explicitly integrating cooperative learning principles into the narrative and gameplay (*sections 4.2-4.3*). The embedded unit of analysis in this case was coding for specific instances of designs for collaborative learning as well as specific instances of collaborative learning that the *AGOG* team observed during game play. In *section 4.4*, I followed a similar analytic process for uncovering design strategies that can be aligned to the specific design features of ARGs, namely, their transmedia interfaces, their participatory narratives, and their authenticity. I will revisit the design strategies that the *AGOG* team applied in the Findings Chapter (Chapter 6), where I will connect them to the Information Ecologies framework that I used to analyze existing ARGs (Chapter 2). In my Findings, I will also integrate the *AGOG* design strategies with the design strategies of the Finksbrary design case (Chapter 5), extending the Information Ecologies framework to develop a repertoire of design strategies for designers who aim to create new ARGs for teens in learning contexts, and researchers who aim to study their effects.

Chapter 5: *Finksbrary*: A Case Study of Rural Public Library ARG Design

In this chapter, I investigate the design process used by a youth services librarian and her small group of teen volunteers as they developed and implemented three small scale ARGs (over the course of three summers) to promote the summer reading programs for their rural community's public library system. This case study offers a design-based view (Sandoval & Bell, 2004; The Design-Based Research Collective, 2003) into the evolution of approaches that the public library team employed to make the traditional ARG format more accessible to youth (11-17 years old) and to encourage greater participation by their local community members in library and literacy-related events. I introduce the case with an overview of data collected, timeframe, and the focal participants from the Finksbrary team. Next, I describe in detail the design sessions, design artifacts, and gameplay artifacts that the library's ARG design team produced over their three years together. I summarize these sessions with a concluding discussion. In keeping with the study's informed consent and participant privacy requirements, I employ pseudonyms for one of the librarians and the teen designers. The lead librarian for the design team agreed to have her name to be included in the case study, so her name is not anonymized. The branch library where most of the design sessions were conducted is located in a rural county in Maryland, and for the purposes of this study, its pseudonym is "Finskbrary" (also the name of its YouTube channel).

5.1 Case Study Overview

The Finksbrary ARG team included two librarians (one of whom managed the library's youth services and teen advisory board) and three teenage girls. The design

and implementation setting for the Finksbrary ARGs was a rural county public library system. All of the Finksbrary team's design efforts were thus focused on an *informal* and *out-of-school* context. The three Finksbrary ARGs were crafted over three years (June 2008-August 2011), with a one-year design cycle taken for each ARG. Table 5.1 provides a snapshot of all three Finksbrary ARGs and their respective design timelines. When the girls first began the ARG design group, they ranged in age from 12 to 14 years old, and all of them required transportation by adults to their volunteer design sessions. Toward the end of their ARG design experience, the oldest girl was almost 18 and driving herself to all of the design sessions, while the youngest was in the process of earning her learner's permit. In effect, over the 3-year program, the girls were not only growing as ARG designers, they were growing into adulthood. As one of the teen designers noted during her interview, *"Yeah, I mean I just voted this year... I **just voted**. I mean it's so crazy to think how much has changed. And it's so awesome. This is totally a little bit off-topic – but **because of this game** I'm actually going into Library Science. Like, I'm going to go get my master's degree and become a librarian. 'Cuz I wanna do stuff **like this**. I wanna be invested in kids' programs because ... I grew up in the library for pete's sake"* (Rosie, 18, personal interview, January, 2012).

The data collection process for this case began during the fall of 2010, just as the Finksbrary team was beginning their design process for the final ARG they produced (*Run Red Run*). I coordinated with their lead youth services librarian to attend six team design sessions held during the school year prior to the ARG's launch (November 2010 through May 2011) and one post-game design reflection and wrap-

Table 5.1: Summary of Finksbrary ARGs (2008-2011)

ARG Name/Title	Brief Summary of the storyline	Design Timeframe	Game Timeframe
Find Chesia	A girl's search for her missing parents leads to the archeological discovery of an ancient, Atlantis-like settlement buried beneath the waters of the Chesapeake Bay.	July 2008 – May 2009	June 2009 – August 2009
The Mystery Guest	A mysterious character has fallen out of an unidentified, very old book in the library. Who is he and how can the library volunteers return him to his book?	October 2009 – May 2010	May 2010 – August 2010
Run Red Run	A modern Red Riding Hood is lost in the forest. Players must help her find her way home to her grandmother by finding and decoding clues from other fairy tale characters.	October 2010 – May 2011	June 2011 – August 2011

up meeting (August 2011). The youth services librarian who led the project, Heather Owings, also gave me access to design wikis that she and her team used (PBWorks™ PBwiki). The team shared with me data related to all the available websites for their ARGs, such as character blogging sites and YouTube videos that they had created. Note that some of the actual game websites and character Twitter™ accounts were no longer available during my study, which is a common problem for many ARGs: their online content is as ephemeral as the live game. Once a live ARG has ended, much of the online content associated with it is not maintained and is lost (Ruppel, 2009). I was able to use the *Internet Archive's Wayback Machine* (Internet Archive, 2001; https://archive.org/web/) to access some of the Finksbrary ARG content, but many links were no longer accessible even as early as six months after the final ARG. To gain a deeper, individual perspective of the process, I conducted semi-structured interviews (Fontana & Frey, 1994; Lazar et al., 2010) with key members of the ARG design team. I interviewed Heather twice: once before their final season's design cycle began (November 2010), and once after the program was complete (September

2012). I also interviewed the core group of three teen girls who had participated consistently in the three-year project. All told, the data for this case includes:

- Over 100 design files and images shared across three different wikis (one for each summer ARG);
- Audio recordings for seven design sessions (each session lasted between 75 minutes and two hours, for a total of about 11 hours of audio, which I transcribed);
- Online content from the player/character websites for two of the ARGs (gameplay sites associated with the first summer ARG were no longer available, though design documents were available on its wiki); and
- Interview audio recordings (and associated transcriptions) for the lead librarian and three of her teen designers (totaling about five and a half hours of audio, which I transcribed).

5.1.1 The Finksbrary Team

Heather Owings, youth services librarian and teen volunteer coordinator for her county's branch library, led the Finksbrary ARG team. Her interest in ARGs grew out of her work on an Institute of Museum & Library Services (IMLS) funded Library Services & Technology Act (LSTA) grant project, *TeensConnect*. The *TeensConnect* project was a collaborative effort between the countywide public library system and the county's public schools to educate teens about so-called "Web 2.0 tools" (e.g., wikis and blogs) and to "encourage them to use online technology to cross geographical and cultural boundaries" (Owings, 2009). Throughout 2008, Heather had worked with middle schools in her county, along with a middle school in Estonia,

to help participating students share information and create digital media together using online tools such as Blogger™ and Skype™. During this time, she participated in a regional libraries' conference where game design expert Jane McGonigal gave a presentation on ARGs: "*it was one of those, you know, Eureka light bulb moments when I realized that all these web 2.0 things that we had been learning about could conceivably be put together into one big game and to make something bigger than what they were originally intended to do*" (H. Owings, personal interview, Nov. 2010). Later that spring, Heather invited McGonigal to give a similar presentation at the final *TeensConnect* meeting. In June 2008, McGonigal joined a group of Heather's teens via videoconference to demonstrate how the online tools they had been using throughout the year might be integrated into mixed reality games' experiences like ARGs (McGonigal, 2008b). From this *TeensConnect* meeting, Heather recruited seven teens to participate in an ARG design project that she planned for the following year. Three of the teens that she recruited became her core ARG designers for the next three years.

One of those teens was Rosie[18], a 14-year old homeschooler who had not actually been part of *TeensConnect* but had heard about the McGonigal presentation through community outreach that Heather had done with teen volunteers at the county library. Rosie recalled McGonigal's introduction to ARGs with enthusiasm:

> **Rosie***: There was Jane McGonigal, who had created an ARG off this old Olympic Game... and she created this entire story out of it, and it was* ***really interesting*** *and* ***really cool****, and* ***it was actually put into the Olympic Games***[19]*... and I was like,* ***I*** *want to do something* ***that cool*** *'cuz* ***she's***

[18] All names of teenagers are pseudonyms, per University Institution Review Board policy on research with human subjects (specifically, with minors under 18 years old).

[19] Rosie is referring to McGonigal's ARG, *The Lost Ring*, which was sponsored by McDonald's™ as part of their marketing for the 2008 Olympic Games in Beijing, China (Clifford, 2008; "Find the Lost Ring," 2012).

> ***awesome**. ... So afterwards, Heather was like, okay, if you guys are actually interested in doing one of these things for teens, you should write your name, write your number and your email address and I'm like, Mom, can I **do** this? and she's like yah, go ahead, and I **did**!" (Rosie, personal interview, January, 2012).*

As a 14-year old, Rosie was one of the oldest teens who joined Heather's group. She was also the only team member who was homeschooled. Almost four years after her first meeting with Heather, just after the design team disbanded in August 2011, Rosie celebrated her 18th birthday, and was taking college courses with a goal of progressing into Library Science. During her interview, she repeatedly mentioned the positive influence that Heather (and McGonigal) had exerted over her.

Caroline also signed up to become a Finksbrary ARG team member with Rosie after the videoconference with McGonigal. She was a 13-year old from a local public school when she joined, and a rising sophomore when the summer ARG series ended. Caroline was considered the quiet, but droll member of the group. Rosie compared Caroline to herself, saying "*Caroline is … sort of the same thing as me, but…*" instead of only being "*snarky… she is just plain funny*" (Rosie, personal interview, January 2012). Toward the end of her participation on the Finksbrary ARGs, an almost 17-year old Caroline saw herself becoming more of a journalist than librarian like Heather or game designer like McGonigal. While she recalled the videoconference with McGonigal as an exciting start, she also wanted to ensure that the Finksbrary ARGs remained distinct from McGonigal's designs. For example, in an early brainstorming session on plot themes for *Run Red Run*, the girls considered a mythology-based theme which could involve players getting lost in a labyrinth-like puzzle, but Caroline advised, "*That'd be cool, but I think that would be like Jane's – McGonigal's – we'd end up being sucked into a similarity pattern with hers...*"

(referring to a labyrinth puzzle that was central to McGonigal's *Lost Ring*, during a Finksbrary design session, November 2010).

Figure 5.1: Finksbrary ARG Team.
On the left: Rosie, Kitty, and Caroline are the three teens who participated actively for all three years that Finksbrary produced their summer ARGs. Although their parents authorized publication of their photos, I have blurred their faces slightly for added privacy. *On the right*, Heather Owings poses as Yoda, mimicking the "READ" photo behind her in one of the library offices. Heather posted this picture on one of the team's design wikis, as a surprise for one of the teens, who was a fan of the original *Star Wars* film franchise and one of its main characters, Yoda.

Kitty joined the Finksbrary design team when she was 12 years old, and was its youngest member. By the end of her Finksbrary experience, however, she was able to proudly announce to me that, as a newly minted 16-year old, she had driven herself to her interview with a new learner's permit – and her mom riding "shotgun" (Kitty, personal interview, December 2011). Although she was the youngest, Kitty was arguably the most active, design-focused teen on the Finksbrary design team. In addition to being the participant in the ARG design sessions who liked to stir up controversy ("*she's a firework*," according to Rosie), Kitty also contributed the most to comment threads on the design wikis for all three ARGs. At the end of our interview, she was also the only Finksbrary team member to ask me questions (about ARG design and *AGOG* in particular). She asked design-based questions such as

"*What did the grad students do?*" (referring to graduate students who had completed a design assignment related to *AGOG*); "*Did they have the same problems as we did?"* (wanting to know whether they had trouble dealing with over-complicated storylines, designing puzzles, etc.); "*What school did the ARG with you*?"; and "*How long was the ARG you did?*" She was interested in understanding and comparing her design experience with that of others, and proposed that *AGOG* should be done at her high school, concluding, "*yeah, yeah. Someday **I'd** like to make something like that*" (Kitty, personal interview, December 2011).

Along with Heather, Rosie, Caroline, and Kitty, two others teens and one librarian contributed to the Finksbrary ARG team's three-year design process. One of the teens, Tina, was an active participant during the first ARG (*Find Chesia*), but her family moved just after its conclusion. Another teen, Heidi, contributed to both *Find Chesia* and *Mystery Guest*, but her family moved early in the design phase of the final ARG (*Run Red Run*). Both Tina and Heidi participated intermittently on the design wikis for all of the ARGs, and their comments were included as part of my aggregate analysis of the evolution of the Finksbrary ARGs. However, since they were neither available nor actively involved during my direct observation of *Run Red Run*'s development, I did not include them as focal participants in the design case. In addition, one of Heather's librarian colleagues, Millie, served as an adult co-designer with Heather for most of their ARG design efforts. While Millie consented to include her comments and design contributions from the *Run Red Run* design sessions and the wiki data from all of the *Finksbrary* ARGs, she preferred to remain anonymous, requesting not to be named directly or to be interviewed. Like Tina and Heidi,

Millie's input is included in my aggregate analysis but she is not a focal participant in the Finksbrary design case.

5.2 The Finksbrary ARG Team Launches and Evolves

In this section, I review the design process that the Finksbrary team followed, from their first efforts in 2008 (*Find Chesia*) to their second ARG in the summer of 2010 (*Mystery Guest*). I did not participate in the design process and implementation of these previous ARGs; they took place before I met the team. However, the availability of data on the design process and gameplay for these early experiences was a key factor in enhancing my understanding and guiding my analysis of the process the team followed for their final ARG (*Run Red Run*). These data also enabled me to trace a complete evolutionary arc for the Finksbrary design narrative, from the team's initial exposure to ARG experts like Jane McGonigal, to their early attempts to adapt ARGs for teen/tween audiences, and their final interactions as seasoned game-runners.

5.2.1 Finksbrary's First Foray: Find Chesia

> *"When we started, we were on a high from the Jane McGonigal presentation and we just thought it would be great fun"* (H. Owings, personal interview, November 2012).

Two years before I had the opportunity to observe the Finksbrary team's design process in person, Heather had already launched them into action. In the summer of 2008, after the exciting *TeensConnect* videoconference with well-known ARG designer, Jane McGonigal, Heather recruited five girls and two boys to be part of her ARG design team (Figure 5.2, (McGonigal, 2008b)). However, the boys dropped out after the kick-off meeting because they mistook ARGs for videogames. The girls remained; excited by the open-ended, narrative-oriented features they saw in

ARGs. Given that ARGs are difficult to define (J. Y. Kim et al., 2009) and are sometimes mistaken for more traditional, console-based videogames (Pellicone et al., in press), Heather and the girls found the boys' departure interesting, but unsurprising (H. Owings, personal interviews, November 2010, September 2012):

> ***Heather**: The program with McGonigal was a pretty mixed dynamic; I would say half boys, half girls. But, I noticed that the boys seemed more disappointed that this wasn't like a video game with levels to master. The two that dropped out were, in fact, boys. I think that... there's a certain openness in the alternate reality game because you allow for player participation to change your storyline and ... I'm not a psychologist, but it was definitely the girls that were more open to that concept than the boys (personal interview, November 2010).*
>
> ***Kitty**: Well my brother and his friend went, because they thought it was like a video game. It wasn't, so they dropped out (laughs). … I like writing and fantasy… and having this kind of fantastical element to the **real** world -- like **here**, and not just like in a book or something.... **That's** pretty cool (personal interview, December 2011).*
>
> ***Rosie**: At the time it was me, Kitty, Caroline, Tina, Heidi, and these two dudes who had no clue what was actually happening. Needless to say the next time we had a meeting, they were **not** there (personal interview, January 2012).*

How to invent an alternate reality
tips from game designer Jane McGonigal
the future of games
1 of 18
10 Steps to Inventing an ARG
1. Start a puppet master team!
3 of 18

Figure 5.2: Sample slides from McGonigal's videoconference with the Finksbrary teens. Her tagline was: "Tips for young designers."

Once they had established the core team in July 2008, Heather invited the teens to their first wiki (*teensconnectarg.pbworks.org*) and began monthly design sessions. Many of their initial wiki pages referenced existing ARGs, particularly

those that McGonigal had helped to design, such as *The Lost Ring* and *World Without Oil*. As Heather noted in her initial interview, "*with Find Chesia, we built...not strictly on what Jane McGonigal presented, but we did try to keep to her guidelines*" (H. Owings, personal interview, November 2010). Over the next year, the team brainstormed transmedia elements characteristic of many large-scale, adult-oriented ARGs. When they launched *Find Chesia* in June 2009, they had created a complex mystery about an ancient city lost under the Chesapeake Bay, two different character blogs with associated email and Twitter accounts, and a YouTube introductory trailer. However, for the teen designers – and ultimately their teen audience – their attempts to mirror the features of an adult-oriented ARG, even on a small scale, proved to be challenging.

> ***Kitty**: The thing was that [McGonigal] could put on this really cool, complicated stuff … We tried that the first year until we realized that we just didn't have the same resources that she did (personal interview, December 2011).*
>
> ***Heather**: Once we launched Find Chesia, fairly early on, we found that teens were **not** playing it the same ways that adults would… (personal interview, November 2010).*
>
> ***Rosie**: With Find Chesia, I think we kind of overshot. It was really fun but – we just dove in head first into the deep end without even bothering with little floaties (laughs). We were drowning. It didn't fail... it just didn't go the way we planned exactly (laughs). I mean we had all sorts of lavish ideas that required a TON of money -- and would have been BRILLIANT if we'd been able to do it (personal interview, January 2012).*

Overall, many of the issues that arose during *Find Chesia* were related to *differences between the ways in which **adults** interact with ARGs and the ways in which **teens** would approach them*. How did the Finksbrary Team first identify and tackle these challenges? They started with the *Find Chesia* storyline.

Figure 5.3: A snapshot of the promotional video for *Find Chesia***.**
Note the official "from Carroll County Public Library" caption. Here is an excerpt of Chelsie's related blog post: *"Hi, my name's Chelsie. I got this bracelet for my 14th birthday. My aunt says it's from my parents, but the thing is that I haven't seen them in a year. They disappeared after my last birthday. They were working on an archaeological dig and one morning they were just gone. The bracelet is the only link I have to my parents. I'm hoping it can help me figure out what happened to them. Do you think you can help me?"*

5.2.1.1 Designing the Story: Literacy Practices and Character Sketches

The narrative that the teens created for *Find Chesia* revolved around Chelsie, a14-year old girl whose parents had disappeared while working at an archaeological dig. Chelsie believes that a bracelet her parents gave her is tied to the mystery. She confides in the players, asking for help (Figure 5.3). Eventually, through her interactions with two other archeologists, she learns that her parents may have been on the verge of discovering a Native American city that had disappeared under the Chesapeake Bay hundreds of years before. However, Chelsie is not sure whom to trust: the two archeologists may be competing for whatever secrets lie with the remains of the ancient city of Chesia.

One of the team's goals was to tie their ARG narrative to the ALA summer reading theme. Initially, they had thought that the 2009 summer reading theme was "water," which would feature books about oceans, rivers, ships, and similar topics. Their idea for Chesia, a city lost in the Chesapeake Bay, grew from this theme. To ensure that their fictional Chesia was grounded in real history of the Chesapeake Bay, Heather invited a friend who had studied archeology and anthropology to provide

background on Native Americans in the region, and they gathered web resources on Native American history. Heather's hope was that these resources would not only help her design team create puzzles and riddles for their players, but also help future players uncover clues and formulate answers. The following excerpts highlight the sequence of ideas that led to some of *Find Chesia's* key narrative elements. They also illustrate the ways in which the team shared ideas about how to weave historical information and web resources into their fiction.

> ***Rosie:*** *I think it would be awesome if we "found" the lost city of Atlantis. We could then incorporate the Bay into that by having Atlantis be in the Bay and you need to "save" it because of pollution….*
>
> ***Heather****: To go along with Rosie's comments, I was thinking that the Percy Jackson [book] series has moved Mount Olympus to New York City (or above it really), so in the same way, we could move Atlantis under the Bay.*
>
> ***Kitty****: We might be able to do a thing where Atlantis has a sister city in the Chesapeake Bay and we need to find it.*
>
> ***Heather****: If we go with the sister city idea, and name it Chesia, where do we want that story written so game players can discover it? Would we want to create an informative website that details the connection between Chesia and Atlantis?*
>
> ***Caroline****: I could work with Chesia being related to Atlantis, but I don't think that it would be for the best. It would hold us down too much.*
>
> ***Heather****: I think we should narrow down the year or time period that Chesia sank. That will help us fit in historical facts, figure out what they might have been wearing and how complex the language would have been.*
>
> ***Kitty****: There's really cool fossil deposits at the Cliffs at Calvert, that wash up crabs, whalebones, and croc. teeth. Does the archeologist find somethin there???*
>
> ***Heather****: I've added some facts about the Chesapeake above. I bolded and added color to the points that I thought we might be able to use to make our story of Chesia more believable (Find Chesia design wiki excerpts, July - Oct 2008).*

The team had also decided early on that the game's protagonist-by-proxy would be a teenager, like their peer players and themselves, and that there should be at least one adult who had expertise that could help her find information about her

parents' disappearance. They also felt strongly that there should be a "bad guy" who would compete with Chelsie's adult ally:

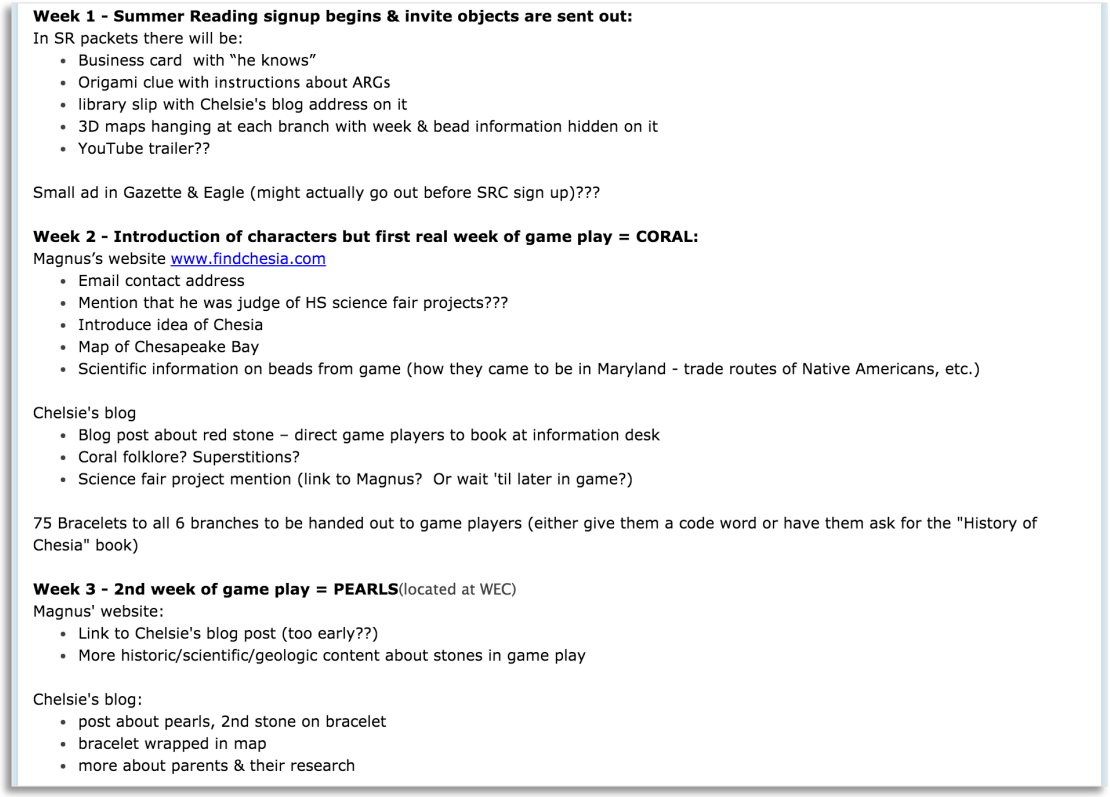
> **Rosie:** *We had Magnus Carter, who was looking for Chesia, and had discovered some of Chelsie's parents work ... He was a good guy. We also had Abigail Spencer -- She was the bad guy... She was **all my** doing and I was **very** proud of her because she was really – really great. Marcus and Chelsea were gonna realize that they were both on the same side and that Spencer was the evil person and ... they were gonna beat the bad guy. Like ... the stereotypical hero story. You know how Draco was a bad guy in Harry Potter...? When really he's just the misunderstood kid who really wants to just fit in? I wanted to create a character that was kind of a mixture of Draco, Snape, and Voldemort -- only more of the Tom Riddle part of Voldemort. Basically, I wanted to create an evil character that I liked. I wanted to create a character that had a good side at one point... but then, so much bad crap happened to her that she was just like, you know what, screw it, I'm evil now (personal interview, January 2012).*
>
> **Kitty**: *What kid wouldn't like the idea of the **adult** being the bad-guy? (Find Chesia design wiki excerpt, July 2008).*

After they had decided on the overall narrative arc and characters, they collaborated to write character blog posts, establish email addresses, link character websites to various online resources with historical and geological data. Most of *Find Chesia's* design wiki contains writing and resource assignments, such as the list from November's meeting, below. In addition, the team continually updated a *Timeline* wiki page that outlined timeframes for sequencing and releasing character blog posts (with clues embedded in those posts), as well as information on artifacts and clues that would be located in library branches across the county (Figure 5.4 features an excerpt).

> ***Wiki Agenda November Meeting:***
> *- **Caroline:** Check information … on erosion, acidity; Look up the 7 gems we use on the bracelet.*
> *- **Rosie:** Write that newspaper article about Chelsie's Science Fair … Spencer is a judge there!*
> *- **All:** Write on the backs of Magnus Carter's business cards: "He knows…"*
>
> (Find Chesia design wiki excerpt, Nov 2008)

Throughout the year, Heather and her team found that while generating narrative ideas was easy, determining how the players would interact with that narrative was not. Their ideas were often more numerous and complex than their resources could accommodate, which foreshadowed potential complexity issues that players would have to navigate.

> **Abi**: *I think the problem was that in the first ARG - we had just so much stuff - and it was so complicated – When we realized that we just can't do this all, we'd like – already started it... So we couldn't really backtrack (personal interview, Dec. 2011).*
>
> **Heather**: *I'm a little worried here, girls. It seems to me that we have enough themes floating around to do 2, maybe even 3 games! ... Should we divide it up and make it 2 games, one for the Summer Reading Program in 2009 and one for 2010?* (Find Chesia design wiki excerpt, Sept 2008)



Week 1 - Summer Reading signup begins & invite objects are sent out:
In SR packets there will be:

- Business card with "he knows"
- Origami clue with instructions about ARGs
- library slip with Chelsie's blog address on it
- 3D maps hanging at each branch with week & bead information hidden on it
- YouTube trailer??

Small ad in Gazette & Eagle (might actually go out before SRC sign up)???

Week 2 - Introduction of characters but first real week of game play = CORAL:
Magnus's website www.findchesia.com

- Email contact address
- Mention that he was judge of HS science fair projects???
- Introduce idea of Chesia
- Map of Chesapeake Bay
- Scientific information on beads from game (how they came to be in Maryland - trade routes of Native Americans, etc.)

Chelsie's blog

- Blog post about red stone – direct game players to book at information desk
- Coral folklore? Superstitions?
- Science fair project mention (link to Magnus? Or wait 'til later in game?)

75 Bracelets to all 6 branches to be handed out to game players (either give them a code word or have them ask for the "History of Chesia" book)

Week 3 - 2nd week of game play = PEARLS(located at WEC)
Magnus' website:

- Link to Chelsie's blog post (too early??)
- More historic/scientific/geologic content about stones in game play

Chelsie's blog:

- post about pearls, 2nd stone on bracelet
- bracelet wrapped in map
- more about parents & their research

Figure 5.4: Excerpt from the *Find Chesia* design wiki, August 2008 – May 2009.
This partial timeline shows the number and types of in-game resources that the design team planned for each week. Only the schedule for weeks 1-3 is shown here.

Moreover, Heather grew to realize that beyond learning to juggle the complexity of managing multiple sites and characters, her teen designers struggled with inhabiting the adult characters they had created:

> **Heather**: *In McGonigal's games… where, I guess adults have that willing suspension of disbelief, or that ability to just jump in and pretend to be somebody else, the teens really were against that. When we were running the game, our teens that were running the games, our four volunteers,* ***really*** *had a hard time pretending to do the roles of the different characters because they didn't want to be* ***misrepresenting*** *themselves online* (H. Owings, personal interview, November 2010).

> **Rosie**: *Whenever we needed an adult -- a quote-unquote "adult" -- post, we had Heather or Millie post something... Millie would help me post as Spencer, like anything we had to write for Spencer* (personal interview, January 2012).

> **Heather***: Again, they did not want to post as the adult characters. They were okay with posting as teenage characters, but they really felt that they didn't represent themselves as adults and they also felt like they would screw up the information as adults. So - there was one, "I don't think I can pull off being an adult," and two, "I don't want to misrepresent myself as an adult." In Find Chesia, for the adult characters, we were like, "we need to give players this information -- this, this, and this" ... and it had to be more structured [like an adult]. So, they felt it wasn't* ***their voice****. That was a disconnect as well.* (H. Owings, personal interview, September 2012).

5.2.1.2 Teen Player Concerns: Internet Safety, Parental Influence and Logistics

Ultimately, Heather felt that this resistance was linked to Internet safety training that youth receive in school and at home. Once *Find Chesia* had started, they realized that Internet safety concerns also influenced the ways in which their teen players could interact. While teens (13-17 years old) may be of legal age to access many social media sites, their access is still heavily influenced by parental and school policies ("Children's Internet Protection Act," 2011; Shapiro & Ossorio, 2013).

> **Heather***: One of the things that we were gonna do is have them post pictures or they could send us pictures and we could post them through Flickr, but we found a real resistance … both for some teens and their parents, because they didn't know exactly what it was gonna be used for and how it was gonna be used. And with a lot of parents, they didn't really see the educational purpose behind the game and so they weren't … I guess, supportive of their kids sending in pictures or contributing to blog posts and things like that*. (H. Owings, personal interview, November, 2010).

In some cases, privacy and security was the concern; in others, it was the type of technologies or media that teens were allowed access to, whether at home or at school.

> **Heather***: One of the other things is that, like in A World Without Oil, adult players were actually posting videos to YouTube and sharing them and tagging them as part of the game. But, not all of our game players have access to the same amount of technologies at home. So, when we tried to incorporate that in Find Chesia, we found that asking them to post anything onto the web or creating anything to post – it not only brought up Internet safety issues, you also needed buy-in from parents. It was kind of a struggle in that we weren't really just addressing our game players… we had to address their parents by extension as well.* (H.Owings, personal interview, Nov 2010).

In addition to concerns about privacy and mixed access to social media sites and media sharing technologies, teens who were interested in playing *Find Chesia* faced another practical problem: many of them did not know how to drive. Even the design team, with each of its members coming from different schools across the county (or, in Rosie's case, from home), had to depend on parents to get them to their design sessions:

> **Rosie***: That first year, we met at [the West branch library] a lot of times, which was a saving grace for me because I didn't have my license back then. So my parents were driving me a lot* (personal interview, January 2012).

This constraint made the design and implementation of physical challenges that are so typical of adult-oriented ARGs, difficult.

> **Heather***: Where McGonigal had no problem getting players in her games to meet in public locations to run the game for The Lost Ring, we couldn't do any of that. We tried some of that with Find Chesia but our target audience doesn't drive, for the most part. So we found it hard to have them come to a location or do a live event because again, we needed, not only buy-in from them, but also from their parents. And most of them either had other siblings they had soccer games or camps or whatever, so we found that the live events section just didn't work* (H. Owings, personal interview, November 2010).

> **Kitty***: One thing was the transportation. Adult players… can go wherever they wanted but we had to think basically: How do you get kids to go to do this thing? That was a big thing our first year... because kids don't have cars.*

> *It's a hassle. I think we would have lost even more players, 'cuz that's just another thing they'd have to do* (Personal interview, December 2011).

5.2.1.3 Teen Player Concerns: Complexity and How do I "play?"

The most important and surprising challenge that the Finksbrary team discovered after they launched *Find Chesia* was that few of the teens they targeted actually played. Initially, there seemed to be high interest in the developing game. When children and teens across the county signed up for the summer reading program

Figure 5.5: Find Chesia "Invite Objects" and bracelets (like the protagonist, Chelsie's, gem-bracelet). *On the left: Find Chesia* "Invite Objects" were flyers folded into origami boats. The flyers contained information on ARGs and invited summer readers to go to Chelsie's blog to play. *On the right*: A bracelet that contained gems that were part of the *Find Chesia* storyline. Players who followed the storyline and solved one of the challenges could go to their branch library and receive a bracelet. The Finksbrary ARG team created all of these artifacts.

in May-June 2009, the Finksbrary team made sure that they also received *Find Chesia* informational flyers pointing to the URLs that hosted the promotional trailer and Chelsie's blog. The Finksbrary ARG team had spent hours folding *Find Chesia* flyers into "origami boats" (Figure 5.5), preparing fake business cards for one of the adult character and maps of the Chesapeake Bay (with a clue hidden with them), all of which were included in summer reading program registration packages. Caroline had even made a "Happy Dance" post on their design wiki after a branch librarian had visited her school to promote the summer reading program and she was pointed out as

one of the game designers (see Figure 5.6). All of the Finksbrary designers responded with excited comments about their role as puppetmasters:

> **Heather**: *Laura that's a fine answer! I have been hearing back from the librarians that are doing book-talking & it sounds like everyone is really excited about the game. So way to go team!*
>
> **Heidi**: *I can't wait. My sister will be begging for help, and i will get to watch and laugh when she messes up!!!!!* (Note: Heidi later commented that she wouldn't tease her sister, though she wanted to.)
>
> **Caroline**: *… Anyway, it's true. Once people who are interested know you're a game master, things get pretty interesting!!!*
>
> **Kitty**: *I'm like……. happy 4 some reason.* (Find Chesia design wiki comments, May 2008).

Happy Dance Page
Page history
Hi!
I just created this page because I wanted all of us puppeteers to have a place to rejoice about our COMPLETELY AWESOME work!
OMG, this is getting even cooler than usual! Some people from the Tanglewood branch of the library came to my school yesterday to try to get kids to sign-up for the summer reading program. It was so cool, because they were handing out our boats, talking about Chesia (One kid in my class pronounced it "Cheese-ia 😎) and one of the ladies even asked me if there were any clues in our video on youtube. Don't worry, I just said that the clues would be more obvious later in the game (is that a good answer?). Anyway, that just drove it home about how really this is.
That's just my current take on it. Post something if you want,

Figure 5.6: Find Chesia Design Wiki excerpt, May 28, 2009.
This excerpt features a colorful page that was created by Caroline after a librarian visited her school to promote the countywide launch of their ALA Summer Reading Program. Caroline was extremely excited about "how [real] this is." Note: Several of the pages created by the Finksbrary teens during their first year of design featured liberal experimentation with font sizes and colors, along with extensive use of text-highlighting and emojis.

By summer's end, however, only a handful of teens had actually participated (Heather estimated between 4 and 6 teens, based on questions posed at library information desks and comments on the *Find Chesia* blogs). Post-game feedback that Heather received from her library's Teen Advisory Board was that those who did

participate were unsure how and where to start. Others never went beyond perusing the materials in their summer reading packages because they were uncertain what "Alternate Reality Games" were. Unfamiliarity with the term – "ARG jargon" as the team later referred to it – prevented many teens from going to the *Find Chesia* sites in the first place. If they did visit Chelsie's blog, they weren't sure how to respond – or if they should respond – to her questions and requests for help.

> **Kitty***: I think that the problem with recruiting our players is that players had to take that first step...Like if you were to put it in front of them and like say, Hey.* ***Do this****, we probably would have had more people. But like,* ***they*** *had to go online and* ***start*** *it and … See, if … an adult saw a rabbithole like in that movie, they would have already been on that website… Once they're there, they click on the secret links. [Kitty is referring to a URL shown in a promotional poster for the movie, A.I., that was a link to the ARG, The Beast.] But for* ***us****, having the website on a* ***paper*** *invite object… Well, you have to* ***get them*** *to* ***go*** *to that site ...and I think that people looked at the paper and they were like – Oh - that's* ***cool****. But then, they* ***didn't go*** *there… I mean, you can't force people to take that first step… and even then, they had to stick with it… over the summer* (personal interview, December 2011).

> **Heather***: We had thought to run Chesia like the adult ARGs that we saw online… But, what we found was that not only were there privacy concerns, but also that it was* ***not*** *intuitive to* ***teens*** *in the same way that it was to an* ***adult****. … Whereas adults would* ***go*** *to new websites, or Google something, or* ***do*** *something ... the teens didn't seem willing to quite take that step... Y'know it didn't seem quite intuitive in their thought patterns. … So much of an alternate reality game requires you to solve the puzzle or find the answer and it just seemed to confuse them, and maybe even frustrate them because the answer wasn't* ***right there****. And they -- either don't have the sophistication in thinking to figure out how to find the answer, or we made it too complex for them*. (H. Owings, personal interview, September 2012)

In addition, although Heather had provided information to staff members at her library and other branch libraries in the county, and although the promotional origami boat flyers included a brief definition of ARGs along with images of sites and objects the team had created, many branch librarians had trouble helping their teen patrons to get started.

> ***Heather****: We had a question on the county summer reading survey that was something like, "what did you think about the alternate reality game?" and ... what I saw over and over again was that it was confusing for the players ... but* ***also*** *for the librarians. The librarians didn't know how to promote it, and*

> *the game players weren't exactly sure how they were supposed to play* (H. Owings, personal interview, November 2010).

Despite their disappointment in player participation rates, the teens were unanimous in their decision to design a new ARG for the following summer. Their approach for their 2010 ARG, *The Mystery Guest*, was focused on design strategies that would address the challenges they had encountered with *Find Chesia*.

5.2.2 Finksbrary's Second Year: The Mystery Guest

When she met with the Finksbrary ARG team for the first meeting of their "second season," Heather had compiled all of the notes and comments that she had seen from the county's Summer Reading Program survey. Armed with notes from the survey and the experiences they had when talking with other teens about what they thought of *Find Chesia*, the team brainstormed their thoughts on "what worked" and "what didn't work" as a way to frame the design of their next ARG (Figure 5.7).

> **Heather***: When we built the pro and con list, the teens came to the realization that it was too big, they were trying to do too much... That's when we kind of looked at how we could adapt... With Find Chesia we tried a couple different twitter feeds, we, you know each character had their own twitter feed, there were many other things going on... So, we kind of went through each thing and we basically were like, ok, well we don't need to do that, we could do this, this really worked, this didn't work, this could have worked better, and we ... basically broke the game apart and examined piece by piece* (H. Owings, personal interview, September 2012).

This provided the Finksbrary teens with a reflective design activity that they captured in a photo and notes to archive on their Mystery Guest design wiki. Given some of the branch library feedback she had gotten through the summer reading survey, Heather also wanted to use their design reflections as part of pitch to the county library director to garner approval to continue the ARG design team:

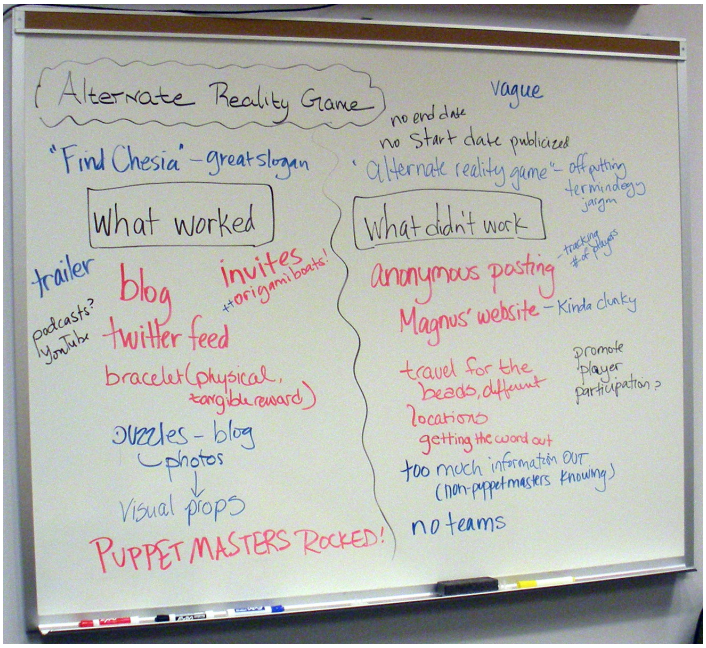


Figure 5.7: Brainstorming "what worked/what didn't work" in *Find Chesia*.

> **Heather***: I shared our photo and notes with our library director and the director's staff to show them that we looked at what we did together, that we reevaluated, and that we were going to present a more streamlined game. When we came back from Find Chesia, it was not y'know, a whirlwind success by any means, and although [the library staff] were always supportive of the game, I think that they were wondering, "How is this gonna add to the library?" I wanted to show that the first one was the baseline and that we were going to alter it and tweak it so that that it would be more playable in the future and also be more part of the summer reading program. Find Chesia didn't really interact with the summer reading program theme at all, and so we worked really hard to incorporate the summer reading theme into what we'd been doing* (H. Owings, personal interview, November 2010).

With a year's experience and the county library's approval to continue, the Finksbrary ARG team set out to address the design challenges they had found with *Find Chesia* by 1) streamlining the narrative; 2) branding all ARG content as an official library program; and 3) revising the types of characters that teen designers would portray and players would interact with, to include a "mastermind" or guide-like character who would help oversee puzzles and assist players when they were stuck.

5.2.2.1 Mystery Guest Strategy for Narrative Design

As indicated by several of the Finksbrary designer quotes from the previous section, using an adult ARG model that contained highly distributed content was challenging – both to players and the designers. Their primary solution was to streamline the storyline into a single game site (http://mysteryguest2010.blogspot.com/). They still used several different types of media to interact with players, such as character blog posts and video. However, all of the *Mystery Guest* media, player challenges, and clues stayed in one space, rather than being scattered across multiple sites.

> **Heather***: The mantra that we keep for Mystery Guest was "keep it simple." With Find Chesia, we were juggling two, maybe three different websites… and we had a couple different twitter feeds and YouTube and character blog sites… We created lots but they kind of fell by the wayside and we didn't use them or we didn't pick them up So, I think that with the Mystery Guest, what worked brilliantly was that we did, we kept it simple. We had* ***one main spot that players went to, the Mystery Guest blog.*** (H. Owings, personal interview, November 2010).

This structural change helped the designers maintain the *Mystery Guest's* story at *one* access point for players, and they also hoped that it would reduce the players' confusion about "where to start" and "what to do next."

In addition to modifying the way that they would present the structure of the narrative to players, the team decided that using an existing, well-known story or character would simplify the amount of original narrative that they would have to create. This strategy had the added benefits of 1) aligning more closely to the library's summer program goals to promote reading, and 2) providing players with a familiar narrative context with which to access the game activities. One of the teen designers suggested that they present players with a library dilemma: a mysterious character has fallen out of an unknown book. The players' goal would be to identify

the character and get him/her back into his/her story. After brainstorming several different popular children's stories, such as *Peter Pan*, *The Chronicles of Narnia*, and *The Wizard of Oz*, among many others, they decided on the Mad Hatter from *Alice in Wonderland* (see Figure 5.8). In addition to the fact that the Hatter character was a plausible troublemaker, Lewis Carroll's story is in the public domain, so the team did not have to be concerned about copyright issues. The teen designers were excited to be able to extend a story that was familiar to both themselves and their peers.

> **Kitty***: We wanted to use an **actual** person... a character. We didn't want to make a completely **new** story. Like the first year I think that it was so complicated, like **inventing** your own person. … For Chesia we had to invent an **entire new life** – **lives**! We thought - well, we would make it a lot less complicated if we could like use someone that **other people knew** … We wanted it to be base it off of a real character. We decided to have the point of it to be like -- you'd try to figure out who this character is, right? So we went into the lists of copyright-expired or un-copyrighted works, and we picked the Hatter. So **now** we **knew** our subject. And then we could base our story on it and we were like **okay**. We'll find him. We'll shake him out of the book* (personal interview, December 2011).

> **Rosie***: It was fantastic because … it was **our** take on the "Alice in Wonderland" story. We got to be like: What would happen if the Mad Hatter came out of the book? We had a **foundation**. Also – we can write about it and we can change it ... because it's public domain now. I mean, **everybody** has written something about "Alice in Wonderland," and their talking flowers, and all that – at one point or another – **everyone** has written about it. And the Rabbit… rabbit-holes? Yeah – it's like the **perfect laboratory** setting for an ARG form. If only we had a bigger audience, it could have been just – Poof – explosion of greatness (laughs)* (personal interview, January 2012).

5.2.2.2 Mystery Guest Strategies for Internet Safety

In response to Internet Safety and privacy concerns that they had heard from teens and parents during *Find Chesia*, the team opted to clearly associate all of their ARG materials with Finksbrary library logos. They also decided to take advantage of the library's social media channels to send out story updates and clues. Narratively, because the *Mystery Guest* character had fallen out of an old library book at one of the branch libraries, the team felt this strategy still supported TINAG, while simultaneously providing teens and parents with an authoritative source from which

to request help. The team reasoned that taking advantage of existing social media channels would not only reduced the number of new feeds that they would have to create, but they would also tap into *existing* communities from which to engage and recruit players.

> **Heather***: For Internet safety, we decided to do everything under [Finksbrary] Library. With everything, we used the library logo, Twitter feed, Facebook page, and YouTube page. We decided that we were going to use them consistently for Mystery Guest. With Find Chesia, we had many sites that weren't clear that they were part of the library (H. Owings, personal interview, November 2010).*

> **Heather***: Here's a thought: Because of web safety issues & how our fake identities online made some players uncomfortable, maybe the video trailer and email address should be for the Library (last year we did a Find Chesia YouTube channel & a Find Chesia email address). It would cut down on the number of websites we would have to create (and then later remember to go back & delete). It also lends a bit of respectability to the game. We could also use the Library Facebook page & Twitter feed (again cutting down on the sites we would create). Thoughts?* (Mystery Guest design wiki excerpt, December 2009).

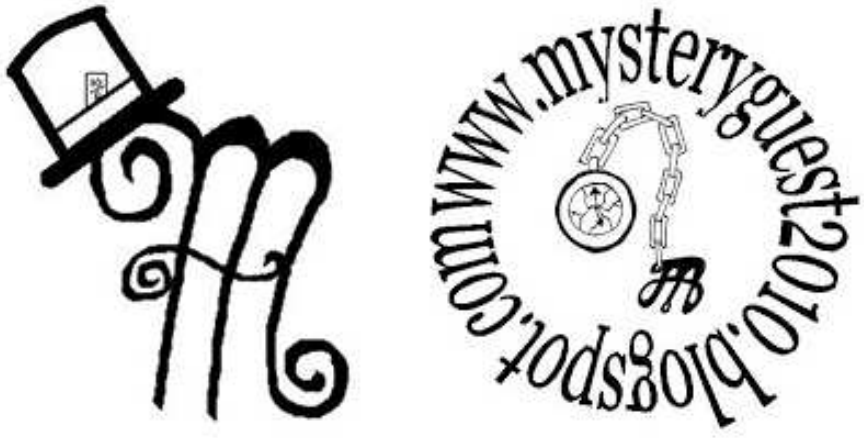


Figure 5.8: *Mystery Guest* logos, created by Rosie.
Clues about the Mad Hatter were embedded in these designs: 1) the hat has a "10/6" tag that was featured in a sketch of the Mad Hatter in Lewis Carroll's illustrated *Alice in Wonderland* (L. Carroll, 1865) and was also referenced by Carroll (L. Carroll, 1890, p. 40); and 2) the pocket watch is stopped at 6 o'clock, which is also significant in *Alice in Wonderland*. The *Mystery Guest* is the only Finksbrary ARG whose website is still accessible (as of 2016). Most of the websites/videos for *Find Chesia* and *Run Red Run* had either been taken offline or expired by early 2012.

In addition to addressing the online safety and privacy concerns that players and parents had, the Finksbrary teen designers revisited the question of how they themselves should inhabit characters for *Mystery Guest*. While they had enjoyed imagining and creating the backstories for Chelsie and the adult characters they had designed for *Find Chesia*, they had been uncomfortable portraying them during the live, interactive game. For *Mystery Guest*, their new streamlined narrative provided an existing, well-known character from which to build player activities. They decided that they themselves, as teen volunteers at the library, could be the ones to discover the errant guest, and then share that dilemma with other youth library patrons. Rather than worrying about misrepresenting themselves online, they could be themselves; rather than asking for help and encouraging players to take action as a fictional teen or adult character, they could encourage players to take action as themselves.

> **Heather***: They decided that the characters would actually be the volunteers… Since they didn't want to create characters, they would* ***become*** *the characters* (H. Owings, personal interview, November 2010).

> **Kitty***: I think we were a lot more concerned about privacy in the beginning, before we really figured out things. Because like, with Chesia in the beginning, we were telling Heather, "Oh - well, my dad won't – like, we don't have Twitter... We don't have an email that we can email players through. And, how can we send stuff without identifying ourselves through email? ... But then it turns out to be* ***us*** *- having a blog and then all of* ***us posting*** *on the blog. We were talking to the players, and they could comment, but the comments – they could be anonymous. And then, with Mystery Guest, players understood that it was "****the Library****." So it wasn't like stalkers there* (personal interview, December 2011).

> **Heather***: We ended up doing video content and blog posts, and they felt* ***much more comfortable*** *with that...because even though they were using pseudonyms, it was* ***their*** *faces in the video, and it was* ***their*** *personalities that were coming through... They didn't have to pretend. With Find Chesia it was very, very complex... With every post, we were trying to get certain information in, and to come from the girls… it didn't sound natural. It didn't sound* ***like them****. With Mystery Guest, we got it much better...on target. It was* ***their*** *voices, and they were allowed to … play. We would just tell them, "Okay, well. We just need to let them [the players] know that the Mystery Guest did this." Then we would leave it up to them, how to get that across.* (H. Owings, personal interview, September 2012).

5.2.2.3 Character-driven Strategies for "How do I play?"

The core challenge they had found in *Find Chesia* was how to help teens learn how to play, or participate in the interactive ARG story. To address this challenge, the team again turned to a narrative, character-driven strategy. With the teens themselves becoming characters, they could not only play with the boundaries of a well-known story from a creative standpoint, but they could also interact more naturally with players as game runners, asking for help, encouraging them and responding to their comments in more authentic ways than they had felt they could do in *Find Chesia*. However, they remained unsure how they, as teens, could give players any clear direction about how to tackle the puzzles that the *Mystery Guest* would pose. As teen volunteers who had uncovered – and maybe even perpetrated – the *Mystery Guest* problem, they looked to their own adult mentor, Heather, to become the guide.

> **Heather***: Most of what came back for Find Chesia was that it was confusing, and that teens didn't know what they were supposed to do and that is why the librarian figure in Mystery Guest was so helpful I think… because it was not only a librarian but it was an authority figure... I mean, it's somebody that they're used to going to for questions that they might have. Often, the players were like, "Wait – what do we do with this?" … That's a question that they would normally ask a librarian. But - with Find Chesia, they didn't know* ***who*** *to ask. So, that was important, too. To make sure that they knew* ***who*** *they could ask questions of…* (H. Owings, personal interview, September 2012).

> **Heather***: Yeah. Using clear, concise directions was the thing. We created the librarian character so that there would be somebody there, giving the teens direction. I think, in an adult run game, if there's not clear directions, the adults might take the initiative to create the directions themselves, or you know, meet the need however they see best to do it. But teens really, well, they're in a culture of education and they are looking for directions on how to do this. Once they know the* ***structure****, then they are more than happy to interact and respond… and that's what we found. We found that with the librarian character they had someone to look to that would give them direction while the teen characters (Kitty, Caroline, Rosie, and Heidi) filled in the storyline* (H. Owings, November 2010).

5.2.2.4 Mystery Guest Strategies: Recipe for Success with Teens

The design strategies that the Finksbrary ARG team used for *Mystery Guest* resulted in a much higher player participation rate than *Find Chesia*, and Heather's

teen advisory board reported that the experience was much more popular with teens. Based on online player comments and the number of "library bucks" that were awarded for solving *Mystery Guest* challenges, Heather estimated that they attracted between 20-30 players countywide, with about 8 players who were active throughout the nine-week experience. "Library bucks" were a Finksbrary County ALA Summer Reading Program incentive that teens could earn for reading books and participating in various activities related to the program (like the ARGs). Children and teens who participated in the summer reading program received points toward library bucks in reading "passports" that contained a record of books they had read and activities they had completed. Rather than earning a sticker or other small prize, like younger children who participated, teens would save up library bucks they earned to bid on larger, more valuable prizes at the end of the summer, such as movie tickets and gift cards. At least three teens earned several library bucks' prizes for solving *Mystery Guest* puzzles, and at least two teens earned coveted a "golden ticket" library buck prize, worth $100, for identifying the Mad Hatter.

Although these numbers were still low compared to the estimated participants in the summer reading program overall[20], the team was excited that their overall numbers had more than tripled, and their active players had also increased. In addition, the teen designers earned a bit of celebrity status in the community when their efforts garnered the interest of *ARGnet*, "the largest and most complete news

[20] Using past summer reading program statistics for their county, Heather estimated that there were about 150-300 children who registered to participate in the program in each branch library. With five branches, the total number of children could range between 750-1500. These numbers included children as young as five, however, so the expected interest in a teen-focused ARG would be smaller. Heather did not have statistics on the number of teens who registered for (and consistently participated) in the county summer reading program.

resource available for players of online collaborative ARGs" (http://www.argn.com/). Heather was interviewed by CNET and *ARGnet*, and featured in *Wired* (Doh, 2010a, 2010b; Terdiman, 2009). She also published a *School Library Journal* article on their experience, with tips for librarians who might want to design their own ARGs for teens (Owings, 2009). Their increasing success and expanding design experience led them to continue for another year.

5.3 The Final Finksbrary ARG: Run Red Run

In this section, I summarize the design sessions I participated in as a researcher-observer for *Run Red Run*, the final ARG that the Finksbrary team developed. I describe salient elements from several sessions, such as specific design goals the team wanted to achieve, the ways in which they tackled design issues, and their team interaction overall. I include data that was posted on their design wikis as they relate to each session, and personal perspectives of the designers, selected from interview transcripts. Themes and background from the first two design sessions are more lengthy and detailed than later sessions because 1) the early sessions were longer (2 hours versus 70 to 90 minutes); and 2) additional themes related to social interactions and relationships arose because I was newly introduced to the team and the teens needed time to be more comfortable with me. Table 5.2 provides an outline of each design session that I analyzed over the course of my year with the Finksbrary team, to help frame the discussion that follows.

5.3.1 Design session #1 for Run Red Run: What's the Story?

The design goals for the first Finksbrary design session that I observed (November, 2010) were to review lessons learned from the previous year and to decide on a

specific plot for their next summer ARG. It was actually the second session of the year; however, most of the October meeting had been focused on all the social trappings of reuniting the group, such as catching up on what the girls had been doing at home and at school since the *Mystery Guest* ended. As she had done the year before (after *Find Chesia*), Heather started the November design session with a recap of lessons-learned. This not only gave the teens' a nice frame from which to brainstorm and settle on the narrative for their next ARG, it also gave me a chance to hear the girls' thoughts on the pros and cons of their design process. Several of the points they made echoed the design issues that had been raised for *Find Chesia* and *Mystery Guest*; however, this marked the first time I had heard them actively discussing them in a design session (see Figure 5.9).

Several major design themes emerged during my introductory session with the Finksbrary team:

- How to *balance the teen designers' need to be social, silly girls "playing as designers" with their growing "adult designer" awareness* of administrative issues (e.g., confidentiality and player recruitment) and practical issues (e.g., translating design ideas into implementable ARG features). Humor and seemingly "silly" or off-topic ideas might be considered detrimental to the library's design goals of engaging youth in summer reading programs. However, sharing

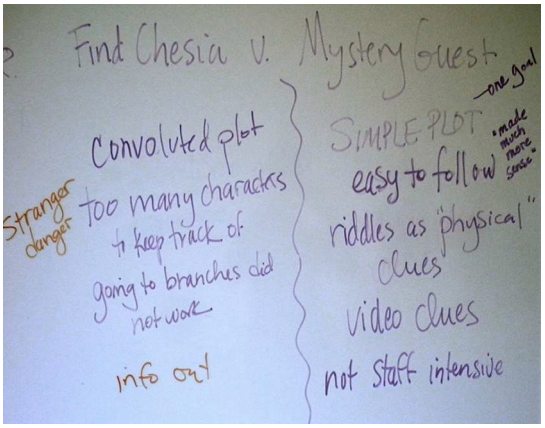
Table 5.2: Timeline, Goals and Description of the Finksbrary ARG Team monthly design sessions.

Finksbrary Design Sessions' Summary for "Run Red Run" ARG (2010-2011)
1) Introductions (November 2010). *Design Goal:* Vote on a game/story "theme," brainstorm titles, and brainstorm "invite" objects. *Description:* The team reviews what worked/what didn't work from last year and brainstorms story ideas, based on the 2011 American Library Association (ALA) Summer Reading Program theme ("*Around the World*"). They settle on a fairy tale theme, focused on variations of *Little Red Riding Hood*.
2) Plotting Player Verbs and a Fail Option (January 2011). *Design Goal*: Determine the players' "verbs" and their overarching endgame goal. *Description*: The team reviews the planned storyline. They decide on the **verbs** that will enable the players to interact with that storyline and sketch out a strawman storyline (e.g., "*Choose Path*" is one of the **verbs** that enable players to interact with the ARG narrative). They also raise a new issue: a fail option. What if players fail to achieve the endgame?
3) Designing Red's video Trailer (February 2011). *Design Goal*: Map out the script for the trailer. *Description*: The team reviews the fairy tale characters that will be sequenced into Red's quest to find her grandmother's house, and thinks of ways to try to include them as clues in the ARG's video trailer. They plan the trailer and decide to add a marker that signals the transition from "real world" into fairy tale world with a move from color to black and white.
4) How does the game work? (March 2011). *Goal*: Transform the players' verbs into the specific activities that players will have to complete. Specify the ways that these verbs will be signaled to players (e.g., in polls, pictures). *Description:* The team reviews the path-based storyline that they sketched out in February and decides how to transform the players' "verbs" into riddles, quests, and other activities that will help get Red to her grandmother's house.
5) How does the game work, Take 2? (April 2011). *Goal*: Transform the players' verbs/activities into the actual game sequence and outline the schedule for the riddles/puzzles/videos that will prompt the players. *Description*: The team builds on the outline from March to nail down the specific sequencing for each player challenge (riddle, poll, video, etc.) and decides on the style of the blog site.
6) Scheduling weekly player challenges and writing initial character posts (May 2011). *Goal*: Review the marketing plan and establish outlines for the weekly challenges. *Description*: The team previews the *Run Red Run* trailer and decides when to post it. They interact with the tumblr blog that will be the game's site, decide on the game "rules" for players, review the outline for each week's activities and responsibilities for blog posts, and write a first draft for Red's introductory blog post.
7) Post-game Reflections and Finksbrary "Goodbyes" (August 2011). Goal: Recap lessons learned and close out the 3-year Finksbrary team. *Description*: The team reviews the death of Red and the final chapter of their ARG design experience. They reminisce over pictures (on their design wikis and Heather's photo album) and take final pictures/videos together.

"silliness" and humor has been shown to promote engagement in educational programs (M. P. Carroll & Carroll, 2014; Masten, 1986; Wanzer, Frymier, & Irwin, 2010) and can enrich both the process and product of design (Bessiere & Druin, 2014).

- How to *balance Internet safety and online privacy concerns against the desire for authentic ARG character interactions*. The Finksbrary team's first two years revealed how they grew aware of the players' – and their own – concerns regarding Internet safety and privacy. These themes were reprised continually in early *Run Red Run* design sessions.
- How to *design authentic characters that the teen designers would feel comfortable portraying, using media that teen players would interact with*. During *Mystery Guest*, the teen designers presented the video clues and player challenges as themselves (with pseudonyms). Several of the video shorts had been created in direct response to input and ideas from the players regarding how to get the *Mystery Guest* back into his book. The team emphasized that they wanted to continue to use videos to connect more meaningfully with players.
- How to *develop a storyline that would be familiar to the teen and child audiences they were targeting, but also novel enough* to keep them interested in playing. Based on their *Mystery Guest* experience, the teen designers felt their most effective design strategy would be to develop a storyline by extending new paths from existing, well-known stories that could be linked to themes from the ALA Summer Reading Program. For *Run Red Run*, they continued to wrestle with designing the right balance between a narrative that other youth in their library

community could recognize and connect to (e.g., mythology, fairy tales) and their own novel narrative extensions.



FIND CHESIA	*MYSTERY GUEST*
Convoluted Plot	Simple Plot => One goal for players
Too many characters to keep track of (for players *and* designers) – and "*Stranger Danger*"	Easy to follow – "*made much more sense*" according to a player
Going to branches for artifacts did not work - kids need transportation	Video clues and riddles as "physical" clues
Hard to get info out to support staff (& players) at all branches	Not staff intensive

Figure 5.9: *Run Red Run* November 2010 session design notes.
On the left: The team highlighted differences in the storyline structures for *Find Chesia* and *Mystery Guest*. *On the right*, the table contains similar information, which Heather transcribed for easily readable reference on the Finksbrary team's design wiki.

5.3.1.1 Balancing Silly with Serious when designing with adolescents

"And on the giggle scale of 1 to 10, you all were about a 37 :-)"
(H. Owings, design wiki comment, 2008)

Throughout the design session, the teen girls' words and actions fit the adolescent mold that has been well documented by studies on youth and new media literacies, such as Livingstone (S. Livingstone, 2008) and boyd (boyd, 2014): "Young people have always devoted attention to the presentation of self" (S. Livingstone, 2008, p. 394). On the one hand, the girls engaged in humorous, sometimes silly teenage antics and showed a predisposition to go off-topic from design session goals, making tangential pop culture references and citing their favorite, current memes. On the other hand, they demonstrated an astute awareness of the design issues they needed to address, especially those that had not worked well in their previous ARG iterations. I also noted the ways in which Heather, their adult mentor, guided them to focus on design issues while at the same time allowing them to be playful, social, and

"creatively, as free as we wanted," as Rosie emphasized during her interview (Rosie, personal interview, January 2012).

Heather approached her design sessions using a Young Adult Library Services Association (YALSA) concept known as "*Radical Trust*," which involves the practice of involving teens in library planning and management decisions typically relegated to adult staff members only (Braun, Hartman, Hughes-Hassell, Kumasis, & Yoke, 2014; Vieau, 2009). Radical Trust is related to the concept of legitimate peripheral participation, which allows individuals who are newcomers to a community to engage in small, but meaningful and productive tasks that, in turn, support that community (Lave & Wenger, 1991). For Heather, Radical Trust with her teens often meant allowing a high giggle count during design sessions.

Heather introduced me to the girls as a university researcher/student who not only studied ARGs, but also happened to be designing an ARG with other university researchers. As part of that introduction, I asked the girls about the "informed consent" forms that I had sent Heather for their parents to review. The girls pointed out that I was not the only individual in the design session who required "informed consent." They demonstrated that they wanted to be true to the ARG tenet of TINAG (*This is Not a Game*) and authenticity, telling me that I, too, would need to sign a "*letter of confidentiality.*" In the same moment, they also made self-deprecating jokes about whether they really needed such a confidentiality agreement, due to the low number of players they had recruited for their previous ARGs:

> **Caroline***: You know you'll have to sign a confidentiality agreement before we let you leave the room… though we might let it slide…* ***this*** *time.*

> **Kitty***: Yeah, because we don't want her to ruin the plot for everyone…*
>
> **Caroline***: Because our following of like, five people is … deep.*
>
> **Kitty***: But those are five* ***loyal*** *people!*
>
> **Rosie***: They are! It's like a cult following. (Finksbrary design session, November 2010)*

Essentially, although they wanted to show me that they adhered to the principle of TINAG, they readily acknowledged that the experiences that they had designed were not on the same scale as most of the ARGs they had learned about from Heather and McGonigal. Considering the potential for power imbalance between adult researcher and youth participant in studies involving adolescents (Poole & Peyton, 2013), the teens were also trying to determine if they could trust me. I had entered into a session where they typically held sway as lead designers, on equal standing with their adult mentors. They may have wanted to show me, in a way that cleverly tied into the mystery that ARGs and their puppetmasters often employ, that they held the "authority over space" (Poole & Peyton, 2013) in their library.

The need for a confidentiality agreement came up several times throughout the design session. At one point, for example, Heather noted that they had had trouble managing the sequencing and distribution of clues once gameplay for *Find Chesia* began. Staff members at other branch libraries in the county inadvertently gave out clues before they should have been released (i.e., they were "spoilers"). This weakness had ruined the experience for players, who were confused by the different storyline levels they saw online versus what they were given in their branch library:

> **Heather***: So… some of the distributed elements in Find Chesia made it easier for the timeline to get out-of-whack at different places. Some players found out about the bead clues and their importance to the plot earlier than others...So, coordinating with other staff members on the sequencing, and when to release certain physical clues was off. I remember talking to one*

> *player at one point in the summer, thinking, 'hmmmm. You shouldn't know that yet.'* (Finksbrary design session, November 2010).

Caroline nodded to me pointedly, saying, "*Okay, so: Confidentiality Agreement here.*" In short, the information that I was gathering from our meeting was not available for dissemination, in order to prevent future spoilers from happening. Throughout this first design session, the girls seemed to make an effort to show me that although they were teenagers, they were still savvy about professional design issues (e.g., non-disclosure, TINAG, confidentiality, informed consent). As Rosie explained in her interview, they wanted to demonstrate that "*we were able to be kids while still doing an adult sort-of-a-thing*" (Rosie, personal interview, January 2012).

5.3.1.2 Balancing online safety and privacy with ARG goals for interaction

Negotiating this desire to tackle "adult" design considerations while still "*being kids playing around with the computer*" (Rosie, personal interview, January 2012) continued to highlight tensions between the ways that adults approach TINAG and the ways that adolescents would play. Heather observed that her teen designers and players wanted to show adults repeatedly that they were aware the ARGs were not "real." Their desire to demonstrate their awareness that the games were a masquerade often "*closed the game off to them*" (H. Owings, personal interview, November 2010). She felt this resistance was also linked to Internet safety training that youth receive in school and at home.

> **Heather***: In McGonigal's games ... adults were willing to take on character roles and were willing to jump into this game playing a character, whereas with the teens we had a whole -- it was almost a resistance -- like they didn't want you to think that* ***they*** *didn't know it wasn't really happening, that it wasn't real* (H. Owings, personal interview, November 2010, emphasis added).

In this design session, as they had for their previous ARGs, the Finksbrary designers discussed differences between characters that had been created for adult-

oriented ARGs and those that they had found worked well with their teen community. While reviewing the design features that did not work in *Find Chesia*, Heather reminded them that they had created adult characters that the teens, even as puppetmasters, were uncomfortable portraying online. Like Heather, the girls attributed this to the Internet safety training that they received in school and at home:

> **Heather***: With Chesia's convoluted plot, we had too many characters to keep track of, and you guys weren't playing the characters in the end. We created characters, but it was very awkward for you to – you know,* ***'assume adult roles'*** *and to be you know, Dr. Spencer and Dr. Magnus Carter.*
>
> **Rosie***: Oh god, yeah.*
>
> **Caroline***: Especially considering that us kids are kind of taught to be very cautious… Remember, we got a lot comments...*
>
> **Kitty** *(laughs): 'Stranger Danger!'*
>
> *(Finksbrary design session, November 2010)*

Finding ways to maintain a sense of TINAG and authenticity while simultaneously respecting teen designers' concerns about misrepresentation – not to mention players' (and parents') concerns about Internet safety – continued to be a recurring theme and salient design constraint for the Finksbrary team, and ultimately, for any ARGs that target youth (under 18-years old).

5.3.1.3 Characters and Videos by Teens, for Teens

Another design goal the teens had for their next ARG was to ensure that they created characters whose roles they felt comfortable assuming. This was related to the misrepresentation concerns that the teens had experienced when trying to portray characters in *Find Chesia*. Moreover, they wanted to develop characters that could interact with players through video. This approach had worked very well in *Mystery Guest* for two reasons: 1) the teens set up and played the videos as themselves, which felt more authentic to them and to their peers; and 2) several of the videos were

created in direct response to player input and ideas, which aligned closely with the ARG design principle of participatory storytelling.

> **Heather***: For Mystery Guest, we also had the video element, which I think really, really helped.*
>
> **Caroline***: Much, much more. Yeah.*
>
> **Rosie***: And you loved us for it.*
>
> **Beth***: Didn't you do videos for Find Chesia?*
>
> **Kitty***: We didn't really have pictures of people... or videos.*
>
> **Heather***: And while we created adult characters, we didn't have actors to play those characters, so… it was difficult to maneuver in that way.*
>
> **Caroline***: The players couldn't **connect** with the characters.*
>
> (Finksbrary design session, November 2010)

5.3.1.4 Building something novel out of familiar stories and cultural touchstones

The final design theme to emerge from this session involved the team's decision for the over-arching plot. Throughout the design session, the team tried to balance the need for a storyline that would be familiar to teens and children in their community (such as a popular book series or well-known genres like fairy tales and folk tales) with something new (such as a character escaping the confines of a book). They had learned from their experience with *Find Chesia* that creating an entirely new plot and story world required too many resources – in writing, in role-playing, in managing story-related websites – for their small volunteer group. They wanted to continue to use existing, well-known narratives with the success that they had experienced with *Mystery Guest*. At the same time, they also wanted to ensure that they presented something that felt new. Throughout the session, the design team sought a balance between the familiar and the novel:

> **Heather***: If we picked a fairy tale, there's familiarity with fairy tales...that might get people who might be off-put by the Alternate Reality Game idea,*

might be - interested more, like "Oh, I know this fairy tale -- I know where this is going type of a thing."

Kitty*: Yeah, then they have an idea of what's happening…*

Heather*: Right. So, with that, what if, say, Cinderella comes to us and she finds out that we have experience with these characters out-of-books [referring to Mystery Guest] and say, she's looking for her shoe... We could go into many different interpretations of the story of Cinderella, especially from different countries, which brings out the summer reading around-the-world theme...*

Kitty*: Here's another idea: Last year, we got this guy back* ***into*** *the book. This year, why don't we -- What if we get someone to get someone* ***out*** *of the book? Like -- somebody just falls into it and they're just like... stuck and we have to...*

Caroline*: I think we had talked about that, but when we checked into it, it was like copyrighted...?*

Heather*: That also sounds like it would tie too much into last year's game, and that might turn off people who didn't play last year -- thinking "Oh, did I have to play last year and if I didn't, does that mean I can't play this year?"*

Caroline*: Every year, we've gotten better, and every year we've had a new plot. I think it really helps if we start fresh. You know what I mean? And, and I think tying it into last year's game would put off possible new people and it would just make it harder for us. Because -- they might find inconsistencies… (Caroline is referring to possible inconsistencies in how they present the story from one year to the next).*

(Finksbrary design session, November 2010)

Toward the end of the design session, after brainstorming plots linked to the mythologies and fairy tales of several different cultures and eras (e.g., Norse mythology, Japanese folk tales, Ancient Greek and Roman mythologies, Grimm's fairy tales), the team decided to use the fairy tale of Red Riding Hood as their base story:

Millie*: Okay. So we are trying to get Red to her grandma's house – but, she keeps getting waylaid by other fairytale characters.*

Kitty*: Yes!*

Heather*: And it only took us two hours.*

Rosie*: That's not too bad!*

Caroline*: We should have a zombie grandmother. Can I be the zombie grandmother?*

> **Heather** *(calmly, but shaking her head "no" as she says it): Yes. Absolutely. We want to add a zombie grandmother. (Girls cheer.)*
> *(Finksbrary design session, November 2010)*

The opportunity to build something new from existing, familiar stories also enabled the Finksbrary teens to take advantage of their own "funds of knowledge" as they developed their budding design skills and design-thinking. *Funds of knowledge* refer to experiences, skills, values, and dispositions that an individual possesses that are rooted in the families and communities s/he comes from (Barton & Tan, 2009; Basu & Barton, 2007; Moje et al., 2004). The concept of funds of knowledge is often used in the learning sciences to refer to the life experiences and knowledge that youth posses that should be tapped to help make learning situations personally meaningful (Basu & Barton, 2007; Moje et al., 2004). The Finksbary teen designers were excited to apply their funds of knowledge as avid readers in order to craft new tales from existing literature, as Rosie explained: "*We had the entire **realm** of literature to work with ... Like that's just – that's every teenage kid's dream – to be able to muddle with literature*" (Rosie, personal interview, January 2012). Finding ways to balance between the familiar and the novel remained a consistent ARG design mantra throughout the Finksbrary design case, from the team's experiences with *Mystery Guest* through the end with *Run Red Run*.

5.3.2 Plotting Player Verbs and a Fail Option (January 2011)

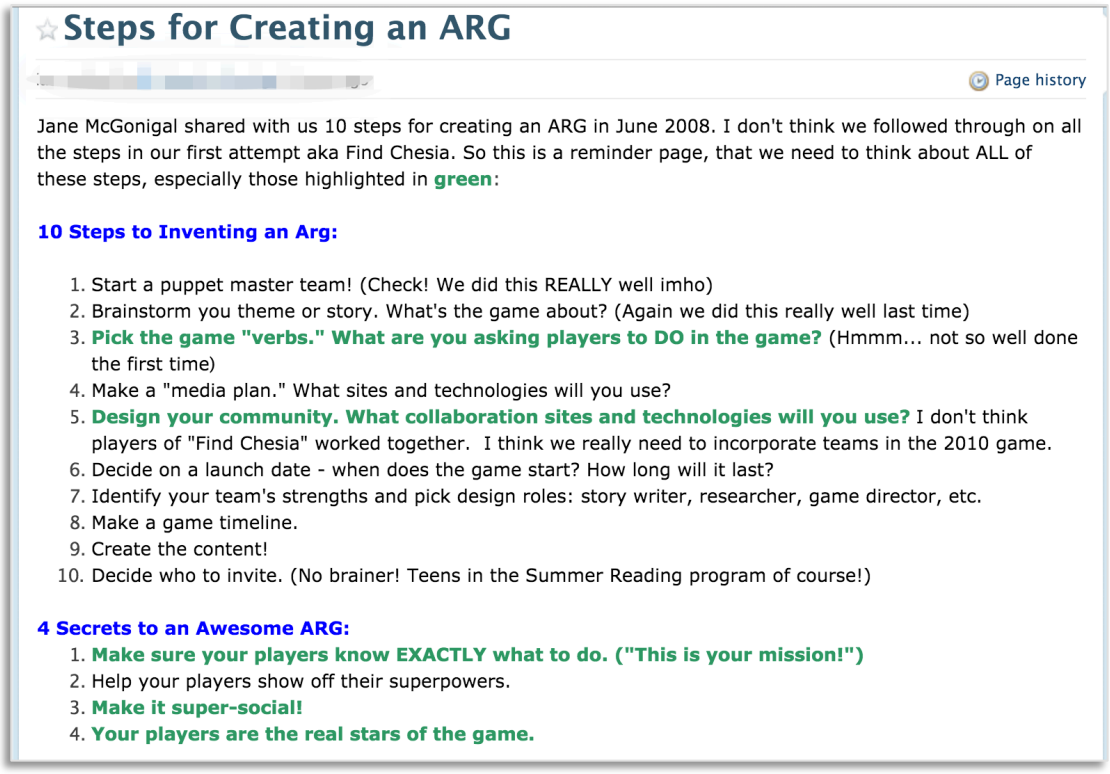
Although the Finksbrary team felt that their focus on McGonigal's adult-oriented ARGs had adversely affected their design process for *Find Chesia*, they decided to revisit the pointers she had provided them with at their 2008 videoconference (Figure 5.10) when they started anew with both *Mystery Guest* and *Run Red Run*. Despite the scattered, pervasive narrative elements and lack of game

rules or player guidance in McGonigal's ARG experiences, the team felt there was value in reviewing her recipe-like design steps. One of her design strategies that they found most useful was "*Pick the game verbs*." This design pointer helped them focus on the actions they wanted players to take throughout the ARG experience. They wanted to avoid the "*How do I play?*" questions and confusion that they had seen players experience during *Find Chesia* by clearly conveying how players could complete challenges and advance through their ARG narrative to the endgame.

Consequently, the team's major goal for their next *Run Red Run* design session was to sketch out a strawman storyline and decide on the **verbs** that would enable the players to interact with that storyline. Another surprising theme that emerged from this session was focused on the notion of a **Fail** option: what if players failed to solve enough puzzles to get Red to her grandmother's house? The teen designers – not the adults – raised this idea, and it proved to be a defining design feature of *Run Red Run*.

5.3.2.1 What if players fail: Can Red Die?

At the very beginning of the session, as Heather outlined their agenda to brainstorm verbs, the team was careful to distinguish between the ultimate goal for their Red Riding Hood character, "Red," and the actions the players would have to undertake to get her to that endgame state. However, given the trouble that teen players had experienced in taking action to help characters in *Find Chesia*, the



Steps for Creating an ARG

Page history

Jane McGonigal shared with us 10 steps for creating an ARG in June 2008. I don't think we followed through on all the steps in our first attempt aka Find Chesia. So this is a reminder page, that we need to think about ALL of these steps, especially those highlighted in **green**:

10 Steps to Inventing an Arg:

1. Start a puppet master team! (Check! We did this REALLY well imho)
2. Brainstorm you theme or story. What's the game about? (Again we did this really well last time)
3. **Pick the game "verbs." What are you asking players to DO in the game?** (Hmmm... not so well done the first time)
4. Make a "media plan." What sites and technologies will you use?
5. **Design your community. What collaboration sites and technologies will you use?** I don't think players of "Find Chesia" worked together. I think we really need to incorporate teams in the 2010 game.
6. Decide on a launch date - when does the game start? How long will it last?
7. Identify your team's strengths and pick design roles: story writer, researcher, game director, etc.
8. Make a game timeline.
9. Create the content!
10. Decide who to invite. (No brainer! Teens in the Summer Reading program of course!)

4 Secrets to an Awesome ARG:

1. **Make sure your players know EXACTLY what to do. ("This is your mission!")**
2. Help your players show off their superpowers.
3. **Make it super-social!**
4. **Your players are the real stars of the game.**

Figure 5.10. McGonigal's "10 Steps to Inventing and ARG" and "4 Secrets" to an awesome ARG. Heather summarized these pointers in wiki pages for both *Mystery Guest* and *Run Red Run* (McGonigal, 2008b). The team's mantra for most of their *Run Red Run* sessions was "*What are the verbs?*" They wanted to ensure that whatever content they made, they could clearly point players toward the tasks that they needed to complete to get Red to her grandmother's house.

teens quickly raised questions as to whether Red would even reach a successful end state. Could she arrive safely at her grandmother's house – if players did not choose to help, or could not understand how to help? In the following extended excerpt from the session, the teen designers demonstrated their desire to adhere to the idea that ARGs are *participatory* stories that adapt based on player input – or lack of input. Based on past experience with low player participation in *Find Chesia* and only moderate levels of participation in *Mystery Guest*, Kitty felt that they should consider a "*Fail option*."

> **Rosie**: *So, will the ultimate goal actually be getting to her grandmother's house?*

Millie*: That's **her** goal. But what do we want the goal for the **players** to be? Are they **creating** a book, are they **going** to a place to get something for her... ?*

Heather*: Yeah. With Mystery Guest, it was **who** is this mysterious character? So, for this, what is the ultimate goal for the players? I mean, Red wants to get to her grandmother's house... but how are we **actually** going to **require** something from the players? Are they **mapping** the way to her grandmother's house? Are they -- if the ultimate goal is to get Red to her grandmother's house, how are they going to solve **that** problem?*

Caroline*: Maybe, so, they could be **creating the map** for Red, or... maybe the gamers can **vote** to see which way they want Red to go...?*

Heather*: Oh, y'mean, kind of like a Choose Your Own Adventure book…?*

Kitty *(interrupting): Oh! Question. **Question**! Is it possible for this to **Fail**? Like, last year, what if we got to the point where nobody could figure out who the mystery guest was and had it possible that we could fail.*

Caroline*: Well, then **we** would have gotten it. (She is referring to their role as puppetmasters.) I mean, then, we would have said, "Oh, **we** thought of **this**!" And then, players would be –*

Kitty*: No. That's the thing. I mean, nobody wants to play a game where you know you're always gonna win because someone – if I was gonna play tic-tac-toe against you and I knew that I'd always win or someone would do something to help me, then… I probably wouldn't play all the time.*

Heather*: So... you want - kind of - the option that, well, this might not work...?*

Kitty*: That they're gonna fail. Yeah.*

Rosie*: Yeah, but with this – it's an ARG. There's no "Game Over, return to start." Like - right?*

Kitty*: Yeah, so if you fail, then, Oh. Crap. You fail. Haha. That's it for you. (Laughter from everyone.)*

Caroline*: Yeah, um. Not many people are as masochistic. (Laughs.) Like, maybe there could be different options...**before** you fail. Like - it's not **instant death**.*

Rosie*: Okay. So we can have an option where you fail. Where characters like the wolf are trained to kill...? (Laughs.)*

Caroline*: … Maybe somehow we could make **them** decide whether Red will actually make it to grandma's ... .*

Millie*: So what we could do... is we could map out the story ... like a Choose Your own Adventure, and have it so that if you make "incorrect choices," you get a harder challenge.*

Girls *(together): Yeah, yeah.*

> **Millie**: *Then what we should do -- if you want options like that -- we should probably map out like, week one. Two options: Go left or Go Right. If you go right, you have a puzzle, if you go left...*
>
> **Rosie**: *Scavenger Hunt!*
>
> *(Finksbrary design session, January 2011)*

Initially, the team used Kitty's question and their subsequent discussion as a means for deciding what type of actions, or verbs, the players could be prompted to help Red along her path. As Millie noted, "*If you go right, you have a puzzle*" to solve; "*if you go left*," a scavenger hunt. Kitty, however, was persistent: they need to consider what they would do if players did not follow the planned verbs.

> **Kitty**: *So, yes, I agree (she is referring to the path choices that they have been discussing). That's a good thing to do. I just want to point out that – there **HAS** to be a **FAIL** option. Like, seriously, at the end. So, like Week 8, y'know, if they -- if the players are … really bad... Then, you can -- she can get ... offed. Really killed off.*
>
> **Caroline**: *Um. I don't -- I don't think that we're really allowed to do that.*
>
> **Rosie**: *We don't really want players to "fail" the game.*
>
> **Heather**: *Kitty, are you envisioning it maybe like a board game, so that, like, if they answer it wrong, she would have to go back to the beginning, or…*
>
> **Caroline** *(laughing): No – She just wants them to fail.*
>
> **Kitty**: *I don't **want** them to fail. That'd be terrible.*
>
> **Millie**: *One problem is, we have no real way to monitor this.*
>
> **Heather**: *The thing is -- The thing with our game though, is that... Well, we already have people resistant to it because it is so open-ended… So to add into that the fact that you could fail, I think that might be an even bigger detractor...for some of the people who are playing the game.*
>
> *(Finksbrary design session, January 2011)*

While Kitty was teased at first for trying to be controversial, Heather gave her and her peers the opportunity to explore the pros and cons of her idea throughout the meeting. They all admitted that this is what could happen in an open-ended game format like ARGs. Indeed, as noted in Chapter 2, early ARGs in the entertainment industry, such as *ILB* and the *Beast* were known for enabling players to change the course of the

interactive storyline.[21] The questions that Kitty and her fellow teen designers raised were thus aligned with the same dilemmas that have proved challenging for professional ARG designers. However, the Finksbrary designers also acknowledged that there were constraints that they faced, as a small team, which made it difficult to allow a fail option. Millie raised one issue, which was the increased design complexity of allowing players to backtrack and try again. How would they consistently monitor and respond to players, or re-route them to the "right" path, especially at different times over the summer? Heather raised another compelling issue, which was whether a fail option would make the game so open-ended that it would close the game off to even more potential players. In the end, the team decided that they would leave the option open as to what might happen to Red if players did not complete the puzzles required to get her on the right path to her grandmother's house. In addition, their discussion enabled them to develop a *Choose Your Own Adventure*-like network diagram that was useful in terms of deciding on player verbs and sequencing challenges.

5.3.2.2 What are the verbs?

Even as the teen designers discussed how Red might fail with Heather and Millie, they also considered the ways in which players could help her onto the right path. They established "*Get Red to Grandma's House*" as Red's endgame, and "*Choose the Right Path*" as the players' overarching verb to get to get her there successfully (Run Red Run design wiki, January 2011). Their next step was to decide

[21] The ILB designers had assumed that players would sympathize with a character known as the Sleeping Princess. Instead, players revealed her hiding place to another in-game character. In response, the designers allowed her to be captured (J. Y. Kim, Allen, & Lee, 2008b). Similarly, in the *Beast*, players were able to convince one in-game character to save another character by interacting with puppetmasters in a live phone call (A. Martin, Thompson, & Chatfield, 2006).

on a set of verbs, or player actions, that would lead them to choose the right path for Red over each week of the nine-week-summer ARG. One of the verbs that they decided upon that they felt was unique and also fit their ALA Summer Reading theme of "travel" was for players to "Choose (or vote on) the Path." At certain points over the summer, they decided that Red would blog that she had come to another fork in the road and players would have to help her choose the right path.

> **Millie***: We have nine weeks to fill. Week One is the setup; Week Nine is the completion… where you find out whether or not she made it or whether she falls off a cliff and dies.*
>
> **Caroline***: Well, we were just talking about how players could vote on where they wanted to go. So then there would really be only one path on the blog...*
>
> **Heather***: Actually that would be a way to reward participants, because players who comment, they could help vote and they could decide which way to go.*
>
> **Caroline***: There's an easy way to do that. You can put polls on the blog. Polls could be a way to get player input.*
>
> **Heather***: This could actually work. We could have them* ***choose*** *here (pointing to one of the node's on their path-planning diagram. See a final version of their plan in Figure 5.12).*
>
> **Millie***: So their goal – their verb, is to choose the path.*
>
> **Caroline***: Yeah. Choose the right path.* (Finksbrary design session, January 2011)

As experienced ARG designers, they also continued to consider how these verbs could be integrated into Red's story in meaningful ways:

> **Rosie***: So, what fairy tales are we using again? Could we do a different fairy tale for every week?*
>
> **Heather***: We're still open to that. Since this year's reading theme is travel, we'd like to go to the origin - go to where the story's origins are. Like for Cinderella, perhaps we could go to France, or...*
>
> **Rosie***: Cinderella is like -- so -- everywhere. I have like, checked out a million books on it. The Chinese have one, there's a Thai version...*
>
> **Millie***: Okay, so how do we want to tie this into the storyline? Do we have a gate that says, you must have X stamps (in summer reading passports) from places that you've visited in books you've read...*

> ***Caroline**: Wait! Remember we're using riddles? We also have that thieve's guild site. They had a whole bunch of riddles.... Maybe for Rumpelstiltskin...* (Finksbrary design session, January 2011).

The above excerpt shows the ways in which the teens endeavored to keep player activities tied to an unfolding story. Although the ARGs they designed might not be as distributed as McGonigal's adult-oriented experiences, the Finksbrary team's efforts to create an interesting, interactive story for teens were very similar to the work of professional ARG designers.

5.3.3 Designing Red's Video Trailer (February 2011)

Video trailers have been a staple marketing tool for the film industry over past several decades arts (Dunn, 1999; Johnston, 2008), and are an increasingly important promotional device for many other fields as well, such as game producers and the performing arts (S. Anderson, 2015; S. B. Preece, 2011). Video is also a common medium that ARG designers use to convey aspects of their story, as a communications channel between characters and players, or as a means for embedding clues and rabbit-holes. The Finksbrary team had been inspired by McGonigal's ARGs, most of which had pre-launch video previews or trailers, and they had seen player interest spike with each video that they had created, even for *Find Chesia*. A video trailer would not only help promote Run Red Run to their target audience, it was also a favorite creative task for the teen designers.

The major design goal for the February session was to outline the video trailer for *Run Red Run*, and to start to finalize the fairy tale characters that Red and the players would encounter as they collaborated to find her grandmother's house. The main design theme to emerge during this session was to find techniques for

embedding clues that could foreshadow the characters that Red would meet along her journey. As Heather told advised them:

> ***Heather**: We want to think about themes or objects that will show up in all the videos. Know what I mean? Because we want it to seem connected throughout. The trailer is an introduction but I don't think we want it to be just hanging out there. We want it to be connected to other videos as we go along* (Finksbrary design session, February 2011).

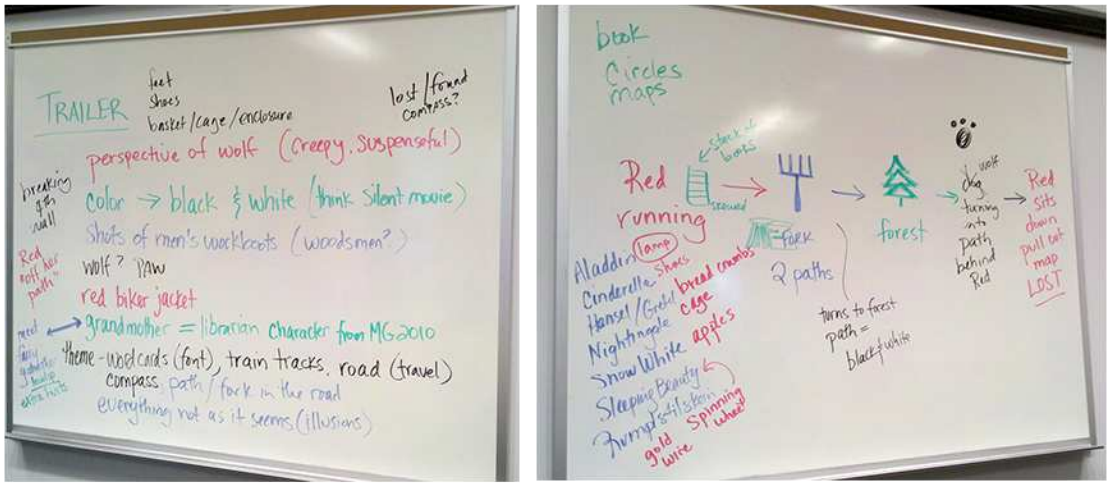


Figure 5.11: Design notes and sketches from the *Run Red Run* video trailer design session. *On the left*, the team brainstormed the necessary visual elements (e.g., red biker jacket for Red, compass, wolf-like figure). *On the right*, they outlined the flow of the trailer itself.

They brainstormed familiar fairy tale symbols that could be hidden in bushes or other spaces along the path as Red walks, such as a spool of thread and a spinning wheel for Rumpelstiltskin, a lamp for Aladdin, and a shoe for Cinderella (Figure 5.11). Rosie likened it to "*an i-Spy thing*," where the players could be challenged to find the items and post questions about them on the ARG site (or physically take the list to a branch library). One of their most interesting design ideas was to make a shift from color to black and white after Red gets to the edge of the forest. They wanted to draw their players' attention to a scene transition from a teen on a mundane walk through the woods to a teen on a quest through a fairytale forest. The shift from color to black and white was a subtle signal to players that "everything is not as it seems" (Rosie,

Finksbrary design session, February 2011). The final trailer opens with Red, wearing a red motorcycle jacket. As the camera pans away from her jacket, the scene transitions to black and white. As she walks along a path, images of objects related to the fairy tale characters that she will meet are shown. The video ends with Red having to choose between two paths while a hooded figure – the wolf – watches from afar.[22] Later, while the ARG was running during the summer, the team used a similar transition from color to black and white to signal the transition from "real-world" to fairy tale in a video clue for players. In the video, Cinderella gave Red an encoded message about the correct path using a book cipher[23] from a classic Cinderella text from the *International Children's Digital Library* (http://en.childrenslibrary.org/) as the key.

5.3.4 How does the Game Work? (March-May 2011)

For the remainder of the *Run Red Run* design sessions (March-May 2011), the Finksbrary team worked to flesh out the path-based storyline that they had established in January and February by transforming the set of "verbs" they had decided upon into actual riddles, quests, and other activities that players would tackle in order to get Red to her grandmother's house. Two themes dominated these sessions:

- *The visual nature of designing interactive narratives like ARGs.* Storyboarding has been a design tool for film-making and animation for decades (Hart, 1999), and has also been used effectively as an HCI design tool (Hart, 1999; Muller, 2008; Truong, Hayes, & Abowd, 2006). ARG designers are no different, as

[22] The *Run Red Run* trailer (and other videos) is available on YouTube, under the Finksbrary channel.
[23] A book cipher typically encodes a message using some aspect of the book as the key (e.g., page number, line number, word or letter number). For example, 10.3.8 might map to page 10, line 3, 8th word.

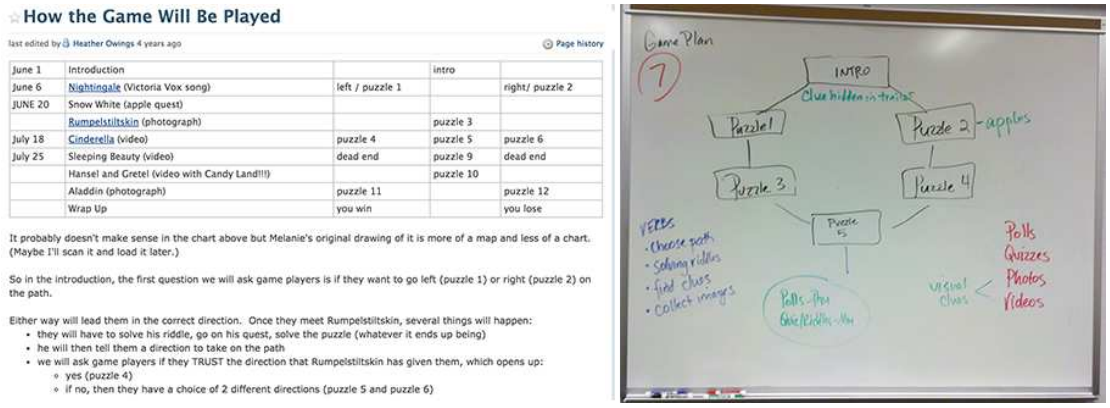
shown by the story bible for *the Beast* (Chapter 2, Figure 2.1) and the story sequencing flow chart for *MetaCortechs* (Chapter 2, Figure 2.3). During the final three design sessions for *Run Red Run*, the team created several different visual diagrams during their meeting and posted them on their design wiki. The designers referred to these diagrams throughout the sessions and continued to use them even after they had launched the ARG.

- *The tight coupling between narrative elements and player interaction*. In many videogames, story exposition is presented in cut-scenes. Cut-scenes are not interactive, but present film-like expository material before or after a player completes an interactive game element, such as a mission or quest (Hancock, 2002). The equivalent "cut-scenes" in *Run Red Run* were blog posts and videos presented by Red and her grandmother. Throughout these sessions, the Finksbrary team thought carefully about the way that Red would ask for help and how she would signal the players to take action.

5.3.4.1 Run Red Run: The Importance Visual Design for Story Sequencing

Given that the players' endgame goal was to get Red on the right path to her grandmother's house, the design team sketched out the puzzles that they wanted their players to follow as a path-planning tool. For each week of their game, they decided Red would come to a fork in her path where she would meet another fairy tale character who would present her (and the players) with a riddle or puzzle. Players could also vote on the path they wanted Red to take. Keeping track of all of the possible paths required a visual (Figure 5.12), which they used on the wiki to create a table that mapped each week to a puzzle and possible outcomes. Their goal was to make the storyline more participatory and dynamic, since players could make

mistakes (following the "wrong" path), but still get back on the right path with the help of the fairy tale characters or the grandmother, who served as a guide and mentor in the same way that the librarian had been "the voice of reason" (Owings, 2009) for *Mystery Guest*.



How the Game Will Be Played

last edited by Heather Owings 4 years ago — Page history

June 1	Introduction		intro	
June 6	Nightingale (Victoria Vox song)	left / puzzle 1		right/ puzzle 2
JUNE 20	Snow White (apple quest)			
	Rumpelstiltskin (photograph)		puzzle 3	
July 18	Cinderella (video)	puzzle 4	puzzle 5	puzzle 6
July 25	Sleeping Beauty (video)	dead end	puzzle 9	dead end
	Hansel and Gretel (video with Candy Land!!!)		puzzle 10	
	Aladdin (photograph)	puzzle 11		puzzle 12
	Wrap Up	you win		you lose

It probably doesn't make sense in the chart above but Melanie's original drawing of it is more of a map and less of a chart. (Maybe I'll scan it and load it later.)

So in the introduction, the first question we will ask game players is if they want to go left (puzzle 1) or right (puzzle 2) on the path.

Either way will lead them in the correct direction. Once they meet Rumpelstiltskin, several things will happen:

- they will have to solve his riddle, go on his quest, solve the puzzle (whatever it ends up being)
- he will then tell them a direction to take on the path
- we will ask game players if they TRUST the direction that Rumpelstiltskin has given them, which opens up:
  - yes (puzzle 4)
  - if no, then they have a choice of 2 different directions (puzzle 5 and puzzle 6)

Figure 5.12 Run Red Run storyline and interactive puzzles as a path-planning network diagram. *On the left*, the sequencing of clues/puzzles was outlined on the wiki, in relation to the sketches that the team made during their design session. *On the right*, the final path-planning sketch that was devised during the March session. This was referred to during the April-May sessions.

5.3.4.2 Translating Verbs into Challenges

As the team worked through each fairy tale character they planned to include, they asked continually, *How do we translate the player verbs that into actual activities, and how do we integrate these challenges plausibly into the "lost in the woods" extension that we have added to Red Riding Hood's traditional storyline?* They focused on finding ways to weave player interaction into Red's storyline through her blog posts. Crafting short blog posts from Red that would suggest courses of action, in an authentic teen voice, was important. One of their concerns involved how they could convey to players that Red could still get lost in the woods, despite today's cellular technology. All of them expected that a modern day, teenage Red would have a cellphone. How and why would she get lost in the first place? How would she share this with players?

> **Heather** *(reading the blog post draft): This app can't get me out of the forest to save my life.*
>
> **Kitty** *(laughing): Who **says** that??*
>
> **Caroline** *(laughing): A **grand**mother.*
>
> **Heather** *(laughing): Okay, how would **you** say it?*
>
> **Kitty***: Hmm. I don't know. I would probably say, "This sucks." But... I don't know if the library would approve of us saying "sucks."*
>
> **Caroline***: I don't see a problem with it.*

Heather approved the more authentic teen diction, and they moved on to the next question they knew their teen players would raise. Why wouldn't Red just call her grandmother to pick her up somewhere near a landmark in the forest?

> **Millie***: We need to figure out why she wouldn't just call her mom or her grandma to come pick her up.*
>
> **Caroline***: So, maybe she dropped the phone. No. She got angry at the GPS **fail**. She threw her phone down. Some of the features got messed up… Her contacts got erased. Who memorizes phone numbers anymore? Not me.*
>
> **Kitty** *(loudly): I hope you players find this message before I **die**! (Laughs.)*
>
> **Caroline** *(laughing): Unbelievable* (Finksbrary design session, May 2011).

Once her dilemma was established, they tried to integrate a way that Red could signal to players that the puzzles and riddles were tied to their summer reading passports. After brainstorming several different versions together, they settled on the blog post shown in Figure 5.13, in which Red presents her problem and points players toward the library.

5.2.5 Run Red Run Live Game: "Dead Red Dead"

At the beginning of the summer, during registration for the county's 2011 ALA Summer Reading Program, teen interest in *Run Red Run* appeared to be at about the same level as the two previous Finksbrary ARGs. Several hundred reading

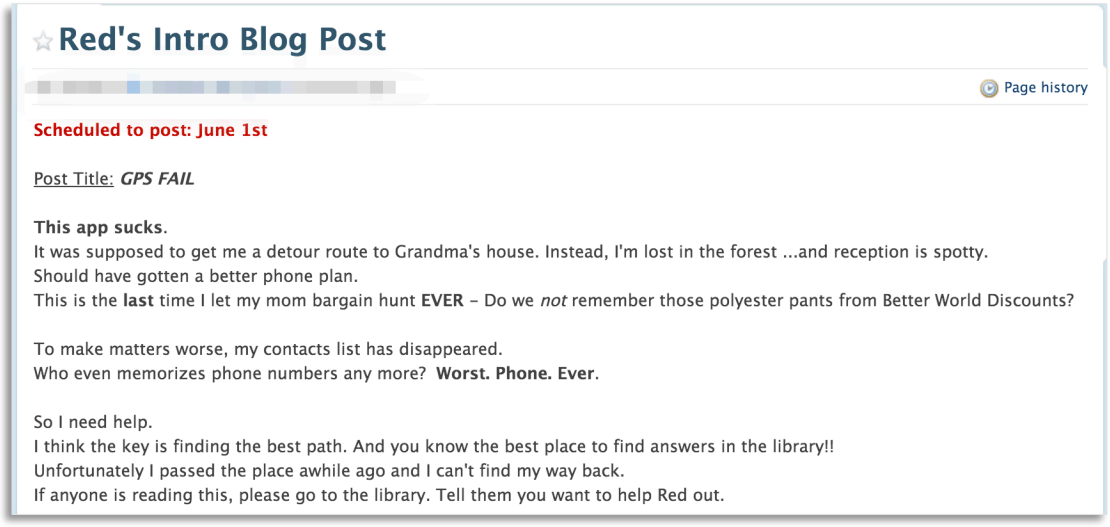

Red's Intro Blog Post
Page history
Scheduled to post: June 1st
Post Title: GPS FAIL
This app sucks.
It was supposed to get me a detour route to Grandma's house. Instead, I'm lost in the forest ...and reception is spotty.
Should have gotten a better phone plan.
This is the last time I let my mom bargain hunt EVER – Do we not remember those polyester pants from Better World Discounts?
To make matters worse, my contacts list has disappeared.
Who even memorizes phone numbers any more? Worst. Phone. Ever.
So I need help.
I think the key is finding the best path. And you know the best place to find answers in the library!!
Unfortunately I passed the place awhile ago and I can't find my way back.
If anyone is reading this, please go to the library. Tell them you want to help Red out.

Figure 5.13: The final draft of Red's introductory blog post.
The team collaborated to create a post that would "sound like a teen, not a grandma" (according to Kitty), and would also explain how a teen could get lost in today's world of cell phones and GPS.

packets were distributed, with invitations to play included. By mid-July, however, it was clear to the Finksbrary team that Red might be lost forever. Player numbers were running about the same level as they had with *Find Chesia*. Despite the best efforts of Red's grandmother, who served the same purpose as the *Mystery Guest*'s librarian by dropping extra clues as she blogged about searching for her granddaughter, very few players had posted solutions to the riddles online or brought them into their branch libraries. In early August, the team decided to create a few posts that implied that Red had been "hijacked" by the wolf (the title of the post was "Hijacked"). The grandmother character made an eerie post about Red disappearing as well (see Figures 5.14 and 5.15). All of the teens were simultaneously disappointed and satisfied that they had followed through with Kitty's argument that, given that an ARG is a participatory story, they could not pretend that Red could survive if players failed her. During her post-game interview, Kitty mentioned that, she was not surprised that the four to six teens who were playing the game could not save Red:

> **Kitty**: *I was not exactly surprised. (Laughs.) Yeah – there weren't that many players. Maybe... four to six...? It's kinda like when you have a boat and you're trying to* ***not*** *sink it, but when you only have three people paddling... well...chances are pretty small…* (Personal Interview, December 2011).

At the same time, Kitty was impressed that they were actually able to follow through on the "Fail Option" that she had argued for several months before:

> ***Kitty****: Well, I actually wasn't there for that session (when the rest of the team decided that Red would "disappear"). And they killed her. The murderesses. (Laughs.) Everybody was like: What should we do if she doesn't succeed? I was like, Well, y'know, you don't always win. Just – You can always kill her. (Laughs.) And then they ended up* ***actually doing*** *that. And I was like:* ***Oh****. (Smugly.) Okay* (Personal Interview, December 2011).

Rosie chose to view Red's end in a positive light as well. Although the game ended in a "fail mode," she was pleased that her peers finally took notice.

> **Rosie**: *We decided to go for a major fail on Run Red Run because -- we were like...* ***Dude****, no one's playing. But also ... we wanted to see how people would* ***react****. Honest to goodness, we did argue with Kitty for like an hour. Then, I was like,* ***okay****. Let's just see what people do if we kill off Red.* ***Amazingly****, we got like 3 or 4 people that came to the library and were like -* ***Why*** *did you guys kill off Red? What did she ever do to you guys? What* ***happened****?? All of a sudden, we were listening to something like* ***that*** *and we were like, "****Good job, us****. We did. We got a reaction out of people."* (Personal Interview, January 2012.)

In her post-game interview, Heather focused more on what they might have done to improve player participation in their final ARG, and by extension, Red's chances of surviving. She compared *Run Red Run*'s character-player interaction to the way in which each teen designer played a distinct "teen role" in the *Mystery Guest*, their most successful ARG. Rather than limiting themselves with blog posts of the two characters, "Red" and the "Grandmother" as they did in *Run Red Run*, each of the girls played an online version of themselves.

RUN RED RUN
Can you help Red make it to safety? The fun begins June 1, 2011 at the Finksburg Library. This game is part of the Carroll County Public Library Summer Reading 2011 program. Created for teens by teens.
Red's End.
2 notes 0 Comments
SHES GONE.
Authorities have found enough to determine that Red could not have survived. If only someone had been able to help her…
0 Comments
DEAD RED DEAD
I have reason to believe that my beloved granddaughter is dead. I have not heard from her since the beginning of the summer. I used to be able to keep track of her here, but she has stopped posting. I've called the authorities several times, but they weren't able to find her either. If anyone has any information-anything at all-please let us know.
2 notes 0 Comments

Figure 5.14: A sample of the final blog posts from *Run Red Run*.
These were retrieved from the *Internet Archive's Wayback Machine* (https://archive.org/web/) and reassembled as an excerpt of the final page. All of the links to comments were disabled by September 2012 and are no longer accessible, even through the Internet Archive.

DEAD RED DEAD	SHE'S GONE
Below is the text for the final "Grandmother" character post. Heather posed as the grandmother, who tried to serve as a guide and mentor to children who were having trouble in school.	Below is the text for the final, short blog post published before the library posted a Thank You to players for contributing
I have reason to believe that my beloved granddaughter is dead. I have not heard from her since the beginning of the summer. I used to be able to keep track of her here, but she has stopped posting. I've called the authorities several times, but they weren't able to find her either. If anyone has any information-anything at all-please let us know.	*Authorities have found enough to determine that Red could not have survived. If only someone had been able to help her…*

Figure 5.15. The text of the two final blog posts, created by Heather and her Finksbrary team. These posts let players know that, unfortunately, they had failed to save Red from the Wolf.

> **Heather***: Of the three, Mystery Guest was probably the most popular, and I think, the most engaging...for the teens.*
>
> **Interviewer***: Do you think it was …more interactive, or because of the librarian, or the kids, or....what was it?*
>
> **Heather***: I think we set very distinct roles, first of all. Y'know: this is the adult, these are the teens. But, in addition to having the librarian...we had four voices. Four different girls, contributing. That's almost like having a different character for each. So, you (as a player) can choose a favorite. Whereas with Red Run Red, we had the one teen, Red, and the one granny. I think the different voices in Mystery Guest engaged different people on different levels. And that made it more interesting. And also too, it was more interesting to do the videos and that sort of thing. Instead of doing Run Red Run the way we did...maybe having each of them be a storybook character and having each one of them contribute to the blogs in the same way... Well, I think Red might have lived.* (H. Owings, personal interview, September 2012).

5.2.6 Post-game Reflections and Finksbrary Goodbyes (August 2011)

In the *Run Red Run* wrap-up for the Finksbrary team, Heather let the girls know that, after three years, she and Millie had reluctantly decided to fold the ARG team. The administrative reason that drove the decision was that Heather was transitioning to a new role in the branch library system that would distance her from managing teen volunteer services, so it would be harder for her to work directly with teens on library outreach projects. This session's discussion reinforced a recurring

theme for anyone who designs or plays ARGs, which is that they are difficult to define or explain, but they are exciting to be a part of.

> **Heather**: *So. Thoughts on your alternate reality gaming experience?*
>
> **Rosie**: *It was fun because... it was an **experiment**, **while** it was **happening**. I mean, I have had **at least 250 people** give me the What?! look, 'cuz I would say, oh yeah, I'm doing an ARG at the **library**. And almost as many people have gone, "Wait. You signed up most of your summer to do this?"*
>
> **Kitty and Caroline**: *(laughing) Yup, Yes, Yeah.*
>
> **Kitty**: *When you say it's an ARG, people think it has to be pirates. (Laughter.)*
>
> **Rosie**: *Did you know that no one can describe a goatee without touching their face? Kind of like an ARG.*
>
> **Kitty**: *Well, it's pointy.*
>
> **Rosie**: *No, listen. What if someone says, "what's a goatee??" It'll be like, "oh. **This** thing" (strokes her chin like she is stroking a goatee).*
>
> **Caroline**: *Yeah, I have something interesting about the whole goatee-ARG thing. When I say, "It's an Alternate Reality Game," people think I'm a World of Warcraft nerd.*
>
> **Kitty**: *Oh my god. That's terrible.*
>
> **Rosie**: *So like, what?? World of Warcraft?? NO.*
>
> **Kitty**: *Yeah, I have a friend who loves teasing me and he will not let it go that I'm doing an ARG thing. He's like, "You LARP??" (Girls laugh.)*

Figure 5.16: The thrill of "Launching ARGs."
For their final meeting as the Finksbray ARG team, Rosie, Kitty, and Caroline asked Heather and me to take some "fun" photos as mementos of their three-year experience. *On the left*, they jump off a bench in the park where the library is located. They wanted to convey their celebration of the end of their run. *On the right*, they make their best attempt to pose as the letters "A," "R," "G" (signifying the "ARG" designers that they became).

5.4 Discussion: Implications for ARG Design from the Finksbrary Team

In this section, I summarize the major design themes that emerged from the three-year evolution of the Finksbrary ARG team's collaborative design process. In my Findings chapter (Chapter 6), I will examine the Finksbrary design case more broadly as an information ecology, alongside the *AGOG* design case. Here, I focus specifically through an analytic lens of interaction design (RQ#1) to examine how Heather and her teens appropriated and tailored the core elements of ARGs (such as distributed multimedia and the integration of fictional content within everyday social media technologies), to address the challenges that they faced while designing ARGs for teens in a public library system. The design implications that emerged for creating ARGs targeting teens in informal learning environments can be synthesized broadly into three interaction design categories: 1) Transmedia interface design; 2) Participatory Narrative design; and 3) designs that balance and manage tensions between narrative authenticity and online safety/privacy.

5.4.1 Teens and Central, Single-sited ARG Interface versus Multi-sited Interfaces

From the time that the Finksbrary ARG team launched *Find Chesia* through the end of Red, one of their most salient lessons learned was that the pervasive, fragmented, distributed narrative characteristic of most adult-oriented ARGs did not work well with their target audience of teen library patrons. Overall, they found that *distributed transmedia narratives were overwhelming and confusing for teen players to follow, and overly complex for teen designers to manage*. Although many teens visited Chelsie's blog after seeing the initial video, they did not seem to know how to respond to her request for help, or they did not follow links to sites of other characters that were embedded in Chelsie's blog and the "Invite Objects" for the ARG (Figure

5.5). Moreover, although Heather and her team followed McGonigal's model of employing social media technologies like the popular microblogging tool, Twitter™ to share character updates, the parents of many teens did not allow them to use any social media tools, and some teens did not know that they could read Twitter™ feeds without an account. The team's use of Twitter™ did garner interest from existing ARG communities like ARGnet, along with modest publicity because Jane McGonigal followed some of *Find Chesia's* character Twitter™ streams; however, there was little to no interaction from their target audience of teens. For the most part, teens did not seem to know how to venture forth into the game of their own accord.

The primary interface design strategy that the team employed to overcome this issue was to *use a single community website* to present the game's narrative and player challenges. This strategy seemed to be less confusing for a teen audience, based on feedback that Heather received through from players of *Mystery Guest* and *Run Red Run* (despite Red's untimely demise). When reflecting on the differences between *Find Chesia* and *Mystery Guest*, Heather was a bit concerned that this design choice may have changed the type of interactive experience her team ultimately presented to players:

> **Heather***: While Mystery Guest retained aspects of Alternate Reality Games, I don't know that in the* ***strictest*** *sense it falls into the category of Alternate Reality Game. … With Mystery Gues,t we had* ***more players*** *and* ***more*** *interaction. That gave us the feeling that we were on the right path. I think that we kind of found the way that it works for the teens as opposed to adults… Teens* ***like*** *to interact in the game, but they're not creating the storyline as much as an adult Alternate Reality Game, so in that respect I don't know that what we keep going back to actually* ***is*** *an Alternate reality game* (H. Owings, personal interview, November 2010).

However, in almost all adult-oriented ARGs, active players develop a single-sited community space for compiling, organizing, and sharing information on the story and player challenges, despite the "secret," distributed nature of their rabbit-holes and other narrative elements (Dena, 2008a, 2008b; McGonigal, 2008a). The Finksbrary team's experience suggests that *establishing a single community site from the outset* can promote initial and more sustained interaction from youth audiences, especially if the site enables players to interact with characters from the ARG storyline.

An interesting difference between the Finksbrary ARGs' community sites and most player-produced ARG community sites was that they were all part of their fictional worlds, not just a game guide site. For instance, *Run Red Run* contained the blog posts for Red, her grandmother, and even the Wolf, and players could interact with these characters on the site. Most community sites for adult ARGs are game guides, walkthroughs, or character wikis and *anachrony audits* (Dena, 2008a, 2008b). Active players who build anachrony audit sites place the fragmented story bits of an ARG narrative into a more traditional linear, chronological sequence (Dena, 2008a). In contrast to these paratextual creations, Dena (Dena, 2008b) would categorize *Mystery Guest* and *Run Red Run* as *diegetic* ARG sites, since they represent the storyworld, not an external, meta-guide to the story. The Finksbrary team's experience showed that using a single-sited, diegetic approach is a useful design strategy for ARGs that target teens.

5.4.2 Guided Transmedia Narratives for teens

In addition to presenting a single entry point and interface to an ARG for teens, Heather and her team also uncovered several design strategies related to the

ARG's characteristic participatory narrative. Two of the narrative-related approaches involve character development and player interaction with characters while another is source-related: where does the story concept come from?

5.4.2.1 Protagonist-Mentor: A Guide for Teen Players

Along with streamlining the transmedia narrative that teen players had to uncover, *Find Chesia* helped the team realize that they would need to add a character who could act as a sort of guide, or mentor for players – someone who would answer any questions they had about how to play as they were interacting with the in-game website. Even after receiving background information on ARGs in their summer reading information packages and learning about ARGs in librarian recruiting talks, teen players showed that they *needed clear mechanisms and models for how to interact with the ARG narrative*. As noted earlier, Heather observed that her teen patrons needed structure and models for action to help them get started, especially in an informal, unguided context: "*teens really, well, they're in a culture of education and they are looking for directions on how to do this. Once they know the* ***structure****, then they are more than happy to interact and respond… and that's what we found.*" In *Mystery Guest*, the librarian character offered the in-game guidance to navigate through the main story beats and to receive clues about the puzzles. Heather's goal for the librarian was to "*break clues down to, not really* ***teach****, but to* ***model*** *…deductive reasoning to get to the solution of the puzzle*" (H. Owings, personal interview, November 2010).

5.4.2.2 The Importance of Enabling Teen Voices for Teen Audiences

In addition to establishing a mentor character to help guide players and to model problem-solving behaviors that are a core characteristic and game mechanic in

ARGs, the Finksbrary teens felt that they were most successful when they created protagonists who paralleled their own personalities and ages. After investing a great deal of time and effort to develop backstories for their adult characters in *Find Chesia*, the teen designers revealed to Heather that, even as puppetmasters, they were uncomfortable portraying these adults during the live game. As Heather observed throughout their ARG design sessions (*sections 5.2.1.1, 5.2.2.2, 5.3.1.2*), the teen designers were concerned that they would be accused of misrepresentation if they tried to assume adult characters, even characters whom they had enjoyed creating. In Mystery Guest, the teen puppetmasters were more comfortable "*using their own voices*," as Heather explained, by presenting narrative clues and puzzles as themselves (under pseudonyms), through video log (vlog) and blog posts. In addition to the protagonist-mentor, these *teen voices* also served as guides, from the perspective of teen players. As Heather observed, having "*four different voices, four different girls, contributing*" was more engaging for players because some of them could "*choose a favorite*" to follow (H. Owings, personal interview, September 2012).

5.4.2.3 Extending New Stories from Existing Fictions

In terms of narrative design, the Finksbrary team's world-building strategy evolved from one that was largely original and required the creation and maintenance of many new narrative artifacts – both digital/online and physical, in-library objects – to an approach that took advantage of existing story worlds familiar to their target teen audience, such as novels like *Alice in Wonderland* and fairy tales like *Red Riding Hood*. Using McGonigal's ARG examples as a guide, the team's initial strategy was to build a completely new story world for players to explore (the lost city of Chesia,

competing archeologists, and a teen in search of her parents). Like the evolution of most ARG storylines, *Find Chesia* grew as a counterfactual extension to existing knowledge (Bonsignore, Hansen, et al., 2013; Bonsignore, Kraus, Visconti, Hansen, et al., 2012a; Compeau & MacDougall, 2014). For example, the significance of the gems in Chelsie's bracelet were drawn from the team's research on the use of various crystals by Native Americans, and the lost city of Chesia was inspired by various Native American tribes that existed before and during European colonization in the 16^{th}-17^{th} century. When Heather and her teens realized that the complexity of this strategy was not only challenging for the players, but also a taxing design process for their small team, they considered how they could benefit from existing story worlds in the books and media that they were trying to promote for the library's summer reading program. Their new narrative design strategy, which involved extending new interactive stories from well-known, existing narratives that children and teens would likely be familiar with (e.g., *Alice in Wonderland*, fairy tales), worked well for several reasons:

- It reduced narrative design complexity and media creation requirements for a small team;
- It allowed the team to take advantage of existing story world resources and not concern themselves with copyright issues, since the base narratives they selected were in the public domain; and
- It was aligned with their library's goals of engaging teens with existing works of literature and building from there.

This approach was exciting to both the teen designers and players, given their growing interest in online fanfiction, or the practice of crafting new story extensions from existing texts, such as novels, television shows, or movies (Black, 2009; Jenkins, 2006). In addition, it was also used successfully by Angela Colvert (2009), whose puppetmaster team of 10-11 year olds designed an ARG for younger classmates (9-10 year olds) that was based on a novel that they had read for one of their classes. Indeed, building from existing story worlds has proven effective for the most successful ARGs from the entertainment industry, such as *ILB*, which extended the virtual world of the *Halo* videogame series; *The Beast*, in which "sentient machines" from the movie, *A.I.*, need therapists as much as humans do; or *MetaCortechs*, which grew directly from the *Matrix* film series and videogame franchise.

5.4.3 TINAG is Tricky with Teens

The topic of Internet safety was a recurring theme throughout the design process for all three Finksbrary ARGs. Online safety remained a concern throughout gameplay as well. As a media specialist charged with educating youth about issues ranging from authoritative sources, self-presentation and privacy, copyright and fair use regulations, "netiquette" and cyber-bullying, Heather often wondered how she could balance the openness of adult-oriented ARGs with the concerns of parents and some of her own colleagues, as well as her teen designers (American Library Association, 2016; Association for Library Service to Children, Librarians & Educators Online, Public Library Association, 2004). Initially, after being inspired by McGonigal's presentation to librarians about the potential of an ARG as a platform

with which teens could practice digital literacies, Heather found that the distributed, frameless nature of ARGs was not only confusing to players, it also raised the concerns of some of her colleagues and parents. Prior to launching *Find Chesia*, she and her design team had wanted to create a story whose design followed McGonigal's pointers, by being distributed across multiple types of sites and multiple characters. After hearing feedback from *Find Chesia*'s players and from Heather's teen advisory board at the library, the Finksbrary team realized that multiple sites were difficult for their small group to maintain, hard for players to follow, and alarming for parents who were not sure that their children should be exploring sites that did not explicitly acknowledge a connection with the county libraries or their summer reading program.

Heather was not the only one who confirmed that Internet safety and privacy issues were a concern for teen players and their parents/adult guardians. Many of the issues were raised by the teens themselves during their design sessions: "*we discussed a lot of these during the puppetmaster meetings – it was definitely then. As I would classify it, they were good kids and they actually thought through what they could and couldn't do online*..." (H. Owings, personal interview, September 2012). Considerations for Internet Safety went beyond the design meetings, too. During her post-game reflection, Rosie explained:

> ***Rosie**: Y'know, we do have a lot of younger kids in the [summer reading] program… like, we have a lot of really intelligent young kids around [the county] and we don't want them getting into bad places on the Internet. There are some blogs that we don't really want kids having access to – or getting confused. So we made sure that we had blogs that were safe.... Also, along with that, we wanted to make sure that it was a well-known website. Like people could be like – "oh, it's Blogspot. That's run by Google. I know Google." That was one of the things that Heather and Melanie were really like – 'that's top of our priorities' sort of a thing.*
>
> ***Interviewer**: How did you guys feel about that? I mean, did you like that, or did you…*

> ***Rosie**: I actually did like that. I was **very** happy about the fact that they were not only trying to make something really fun; they were trying to make something really safe. That was a lot -- That's a lot different than some programs maybe that are out there. Like the Lost Ring...that's maybe fun, but it's mostly for adults…it's not really kid-friendly. … It's really not something – with me as a 12-year old -- my mom would have been like – "Oh yeah. Sure, go ahead – Go online. Go play with The People." **No**. My mom would have been like – "Ummm: Gimme a name, number, addresses, facial expressions, gimme **everything** and then **maybe** I'll consider it and even **then** you're going with one of the neighbors. That sort of thing... So we **definitely** wanted to make sure that parents – well, we wanted to make sure that it was safe.* (Rosie, personal interview, January 2012).

It might be the case that the Finksbrary teens were more conservative than other teens across the U.S., or that they were more heavily influenced by adults/parents, or even that they were trying to show Heather and me that they cared about Internet safety more than they actually did. My findings cannot assert that the Finksbrary teen designers' views on Internet safety reflect those of U.S. teenagers at large. In fact, questions remain on whether teen players outside the Finksbrary county system (e.g., in a more urban setting) would respond more favorably to a distributed ARG like *Find Chesia*, whose online feeds also did not identify themselves as "credible" library program sites. Existing and emerging research on adolescent use of social media and other digital content has shown that teens are not only aware of legal and societal concerns about the level of access that adults control in the name of "privacy" and "child protection," but that teens also actively seek social media that is *beyond* adult oversight and protection (boyd, 2014; boyd, Marwick, Aftab, & Koeltl, 2009; S. Livingstone, 2008; Shapiro & Ossorio, 2013). Instead, many teens view privacy differently than adults: they seek privacy *from* adults, not protection by adults (boyd, 2014). However, the Finksbrary design team *did* encounter resistance to their efforts to follow design guidelines for adult ARGs rather than addressing concerns that they encountered so often in school and at home. Consequently, designers should

be aware that these issues and concerns exist and that they must continue to be negotiated as the develop ARGs and similar transmedia experiences for teens.

As she reflected on her three years with the Finksbrary team, Heather acknowledged that although she was trying to shift to a more positive stance when she helped teens to negotiate Internet safety and privacy concerns, there remains a lot of "negativity:"

> ***Heather:*** *I think it's a social thing, in that we really do teach kids to be afraid of the Internet. ... I think that kind of plays into it. You know: "You don't know what's out there," "Don't post that," or "Don't go to that site," y'know. We're very negative when we talk about the Internet with teens. Ummm, like - "That's not a good website for you", or "That's not accurate information." There's just a lot of negativity. We tell them what they're not getting right, but we don't seem to be praising them when they do get things right. We focus so much on "Oh, don't post that," or "Colleges or future employers could see that," but we never talk about that things you* ***should*** *post online, the* ***positive digital footprints*** *that create positive resources and resume posts or help your college career.*

The scope of my Finksbrary design case cannot accommodate arguing changes in policies for what and how teens access different types of content – or even how commercial organizations or academic/research institutions present information to them. However, it does add to research that shows how complex and confusing information access issues can be for adolescents, 13-17 years old ("Children's Internet Protection Act," 2011; Federal Trade Commission (FTC), 2012; Poole & Peyton, 2013), and how these issues impact the design considerations we encounter and the design decisions we make.

5.4.4 What about Learning from ARGs in a Public Library?

One of the goals of this study has been to gain insights into the ways in which ARG-design can enable and foster 21st century literacy practices, through a lens of learning and curricular design (RQ#2). When I first started data collection for the

Finksbrary case, I asked Heather whether she and Millie had tried to integrate any player challenges that were tied to learning and literacy standards, such as the ones that she had used during her IMLS-funded *TeensConnect* program. Like many ARG designers who had been interviewed for the larger ARG project of which the *AGOG* and Finksbrary case studies are a part, Heather felt that they had not *explicitly* designed player challenges and puzzles to target particular literacies, though ARGs seemed ideal experiences for promoting new media literacies such as information gathering, problem-solving and collaborative sense-making (Battles, Glenn, & Shedd, 2011; Bonsignore, Kraus, Visconti, Hansen, et al., 2012b; Bonsignore, Hansen, Kraus, & Ruppel, 2012; Colvert, 2009; M. Johnson et al., 2010; Whitton, 2008). Rather, she was focused helping model the general information search process:

> **Heather***: When we did TeensConnect, we were working in partnership with the schools and they had given us their digital literacies target list... I pulled out the ones we were using in TeensConnect, and when we started building the ARGs, we realized that they kind of naturally fit into the same digital literacies. … To be honest, we didn't set out to – none of our clues were we like "oh,* ***this*** *is the thing that we want to* ***teach****, and we want to teach them to evaluate clues, or we want to teach them to do this." We were more focused on* ***where*** *they would have to go to* ***find*** *the answers and I guess we were, we were looking more at their* ***searching skills*** *y'know, and building their searching skills ... which is a part of information literacy.... Like, for one of the last puzzles for Mystery Guest, when we didn't get a response from some clues… as the librarian I made a post that reexamined the clues and kind of led them to websites … where they could examine the clues… we were modeling deductive reasoning, and also information literacy in evaluating websites, you know: "Why is this site better than that website?" … But, while we were* ***aware*** *of* ***modeling*** *certain things and teaching them certain things, it wasn't really a strong* ***pursuit*** *on our part*. (H. Owings, personal interview, November 2010).

From a player participation perspective, Heather's primary literacy goal was to experiment with ARGs with an eye toward expanding her library system's community of readers. She compared her ARG design goals with popular entertainment industry ARGs as follows:

> **Heather***: While the entertainment industry is coming from a money standpoint with ARGs, to build interest so people will see their movies or buy their product or what-have-you, ours is* ***truly*** *just a reader's perspective and not even — I wouldn't even go to as far to say you know, we're based on* ***educational*** *goals. We really are about* ***encouraging readers****… We are just trying to share our love of reading. Y'know, obviously all of our ARG volunteers are huge readers and I feel like we're kind of a geek squad, and we're just kind of like, "Hey there's other geeks here, you know, come play with us!" (laughs). … Because the kids are out of school in the summer, we really wanted to incorporate the love of reading, and the idea that reading doesn't mean that you* ***have*** *to read the books that are* ***recommended*** *to you or the classics, or anything like that, you could be reading the* ***cereal box****, you could be reading this* ***blog****, you could be* ***reading anything****. We're really just trying to increase a joy of reading because we work with teens in the library and I gotta tell you, I can't tell you how many kids come up to me and they're like, I hate to read. To me that's just so disturbing that they're* ***taught in school*** *that they* ***have*** *to read this and they* ***have*** *to read that…it just kind of creates this hatred of reading instead of – hey, y'know, it can be a really* ***cool*** *thing to do* (H. Owings, personal interview, November 2010).

Ultimately, however, it was difficult for Heather and her team to assess whether the ARGs they designed increased involvement by reluctant readers in their community, or whether they promoted information literacy practices. Indeed, the low number of players who participated indicated that they were not successful in recruiting reluctant readers, and feedback from teens who did participate suggested that they were part of the library community already – that they were *already* readers. As Heather reflected on the results of *Find Chesia,* compared to her initial hopes of reaching children and teens who did not consider themselves part of a reading community:

> **Heather***: The idea of the ARG's interactive storytelling had really captured our imagination…. We thought that it might be a way to draw in teens that may not necessarily want to read a book to the summer reading program. I guess we were looking for those reluctant readers. But what we found is that the ones that ended up playing Find Chesia* ***were*** *our readers, you know, the kids that did sign up for the summer reading and were participating* (H. Owings, personal interview, November 2010).

The team's response to this realization was to design Mystery Guest as a means for deepening the awareness of different modes of "reading" to the small cadre of readers that they had recruited as players:

> **Heather***: So, with* Mystery Guest*, we brought in a lot more of the reading elements and made it more cohesive… like a summer reading list of recommended reads and things like that, so those came up in our game. When we talked about Neil Gaiman, we also mentioned Coraline… Then we mentioned the Coraline movie, so we tried to keep it interactive, and we were trying to make them aware of the different* ***levels*** *of reading. It* ***all connects*** *no matter what the media, whether it's DVDs or audio books or what-have-you. It's* ***all*** *reading of a sort.*

Although Heather felt that they were not able to assess whether players were acquiring or enhancing the digital literacies that she felt ARGs promoted, she also recognized that the group of teens that she was working with were developing their own literacy skills and confidence in promoting outreach services for their library community. Not long after the Finksbrary ARGs three-year run had ended, Heather presented some of her thoughts on the promise of ARGs and literacies at a local libraries' conference. In it, she chose to highlight what she felt her puppetmaster team had learned throughout their evolution, citing the digital literacies' targets that she had developed from her county's public school system for *TeensConnect*:

> **Heather**: *I included "information literacy" because they had to search for specific information, "visual literacy" because they had to relate them the objects to the stories, and "technology literacy" because they were doing blogs. Ideally, the* ***players*** *would be using those digital literacies, but I don't know that we were successful in measuring whether or not* ***they*** *were doing that. We focused on the* ***puppetmasters*** *because they were the ones that we had feedback from … and that we saw the most.*

5.5 Finksbrary: Concluding Thoughts and Potential for Future Research

In the end, some of the design strategies that emerged from the Finksbrary design case are not necessarily novel. Internet security and privacy are concerns that every designer encounters when dealing with youth under 18 years old in online environments, even for teenagers who may have grown outside of legal and policy restrictions like CIPA ("Children's Internet Protection Act," 2011). Heather's willingness to give her teen designers the room to be both creative and silly during their sessions offers a practical rule-of-thumb for designers and educators who plan to

work closely with teens to design ARGs and other transmedia experiences. However, from a child development perspective as well as a participatory design perspective, the need to be silly and random in the face of serious, more adult endeavors like designing informal learning experiences for other teens is also not an entirely new idea (Bessiere & Druin, 2014; M. P. Carroll & Carroll, 2014; Ito et al., 2013; Poole & Peyton, 2013).

Given the Finksbrary team's limited resources and subsequent low numbers of participants, it was fairly clear they would not be able to sustain long-term ARG development or large numbers of players. What, then, are more positive design implications that we can glean from studying a design process in which these young women played such key roles, at such a young age, over such a long time? Two positive consequences of their participation on the Finksbrary ARG team is clear:

- They had the opportunity to practice several literacies from the Unified Metaliteracies Framework (UMF, Chapter 2 and (Bonsignore, Hansen, Kraus, & Ruppel, 2012)) and New Media Literacies (Jenkins et al., 2006) and
- As lead co-designers for the ARG team, they played an active role in a Participatory Culture serving their county library's youth services program.

While these findings did not fall within the scope of my original research questions about designing ARGs within learning contexts, they do offer potential for new lines of research at the intersection of transmedia design and learning, which I will include in the Findings chapter.

Chapter 6: Discussion and Findings

In this chapter, I summarize the lessons learned and design strategies from both the *AGOG* and Finksbrary design teams. Referring back to my analytic lenses of *interaction design* and *learning*, I begin to build a repertoire of design strategies and patterns that designers and researchers may use to create and implement ARGs for teens in learning contexts. Before examining the various strategies that the Finksbrary and *AGOG* teams employed to address their ARG design challenges, I review the structure and composition of both design cases. Applying the "systems" feature of the Information Ecologies framework, I first contrast the two cases as systems within different learning contexts (formal and informal), whose design teams had backgrounds (and ages) that were also quite different. Next, I focus on two different information ecology aspects for each of them:

- I detail how each case's *locality* or context (formal or informal) affected their efforts to build and/or sustain a player community; and
- I cite specific examples of their creation and use of various *keystone species* that grew from my analysis of existing ARGs (Chapter 2, *section 2.3.4*).

Next, I demonstrate how my analysis employs the Information Ecologies framework to derive specific design implications for ARGs, with a focus on those implemented in learning contexts for teen audiences. I develop a framework for ARGs as narrative systems that range from open-ended to close-ended formats, and propose specific narrative-oriented design questions, which ARG puppetmasters can pose to decide how players will interact with their ARG storylines. I summarize the ARG keystone species framework I have detailed throughout this study, emphasizing the ways in

which the *AGOG* and Finksbrary designers created narrative-centric keystone roles to motivate player participation and to help model and scaffold player engagement with new media literacies.

I also include new research questions that began to emerge through my observation and analysis of the Finksbrary design case. Two areas hold promise for future research at the intersection of ARG designs for learning and participatory design with and for youth. Specifically, I review the effects of ARG design on Heather's teen designers and their development of new media literacies' skills, and touch on opportunities for using co-design as one approach to designing ARGs that target teen audiences.

6.1 AGOG and Finksbrary: Case Comparisons/Contrasts

As noted in my introduction and methods section, the design and implementation setting for Finksbrary was an *informal and out-of-school* context, while AGOG was designed for and implemented in a *formal, in-school* context. The composition of each design team is also very different. Rather than a team of university researchers, creative writer, museum curator, in-service teachers, and school librarian who contributed to *AGOG*, the Finksbrary ARG team included two librarians (one of whom was the lead for the library's youth services and teen advisory board) and three teenage girls. In terms of audience, the *AGOG* team benefited from having access to almost 60 middle school students for their player base, along with public support from the school principal, librarian, and social studies department chair. Thus, for *AGOG* designers, the player community was established *before* the game was launched. In contrast, the Finksbrary team had to engage and

recruit players by coordinating with the library staff and patrons of six public library branches across a fairly large rural county in Maryland (~450 square miles). As a point of comparison, the Finksbrary county has a population density of approximately 370 people per square mile, as opposed to the 1200-2000 people per square mile in surrounding counties, and over 7600 people per square mile in nearby Baltimore City (U.S. Census Bureau, 2015). Because each ARG that they created for a summer program was distinct and stand-alone, the Finksbrary team had to set up a recruitment process for players for all three summers.

The design timeframes for the *AGOG* team and the library team were different as well. *AGOG* was completed over a nine-month period; the three Finksbrary ARGs were crafted over three years (June 2008-August 2011), with a one-year design cycle taken for each ARG. When the Finksbrary design team first launched, the teen designers ranged in age from 12 to 14 years old. When they said their final goodbyes as a design team, they were 16 to 18 years old.[24] The Finksbrary teens transitioned into young adulthood as they evolved as ARG designers. The *AGOG* team included three university faculty members, two graduate students, and a professional creative writer – all adults, and all familiar with design-based research projects.

After launching their ARGs, community support for gameplay was also different across the two cases. *AGOG's* participating students not only attended the same school, they were also in many of the same classes. Although they could interact with *AGOG*'s player community website and chat with others who might be

[24] Based on correspondence with two of the teens and Heather in mid-2013, all of the Finksbrary designers were still keeping in touch via social media – almost two years after they finished their ARG design work.

online at *any* time during the two-week experience, they also had *dedicated time* to interact with the site, *AGOG* gamerunners, and the in-game character, April, in *real time*, during their social studies classes. There was no required commitment outside class time. Each of the Finksbrary ARGs was launched just as summer vacation was starting, so teens would be playing on their *own time*. To earn library bucks from gameplay, they would have to visit the library in-person to collect reading passport stamps or other story-related artifacts. *AGOG's* players had a two-week timeframe to complete individual missions and the collaborative endgame, and received story updates or new mission information nearly every day. The Finksbrary ARGs played out across nine to ten weeks of summer, with one to two challenges per week, and one story update per week.

Interestingly, despite the differences in ages and education between the *AGOG* design team and the Finksbrary design team, their level of experience with various design tools was somewhat similar. Members of both teams were familiar with digital production/creativity tools such as Adobe® Photoshop® and iMovie®, as well as online publishing platforms such as Google's Blogger™. However, the *AGOG* design team employed a dedicated web designer and incorporated custom interactive features into their player community portal, while the Finksbrary designers focused on customizing free, do-it-yourself (DIY) publishing platforms such as Google's Blogger™ and Tumblr™, and used free domain hosting platforms such as Google's Blogspot™. In addition, *AGOG*'s design team included a professional creative writer, while the Finksbrary team found that extending well-known

children's stories (e.g., *Alice in Wonderland*) with their own fictional paths was the most viable design option for them.

6.2 AGOG and Finksbrary as Information Ecologies

Like the seminal ARGs that I analyzed in Chapter 2 using Nardi and O'Day's (2000) Information Ecology framework, the *AGOG* and Finksbrary design cases can be examined as information ecologies in order to derive design implications for ARGs that target youth audiences in learning contexts. For example, framing the Finksbrary ARGs within the parameters of an information ecology, such as the larger library ecosystem in which they evolved and the keystone species that were needed to support them, provides a means for examining the challenges that educators and learning scientists may face when implementing transmedia experiences like ARGs within larger learning community contexts.

Figure 6.1 represents the embedded units of analysis that I investigated for both the *AGOG* and Finksbrary cases. I first presented it in Chapter 3 as a visual guide for my analytical approach for embedded units of analysis. For instance, for Chapter 4's focused investigation on the UMF literacy, "*Collaborate,*" as an embedded unit of analysis, I explored the ways in which the *AGOG* team applied the essential elements of Cooperative learning (D. Johnson et al., 1994) during their design process, then highlighted the various ways in which AGOG's middle school players collaborated throughout the game. Similarly, for the Finksbrary case, when coding for evidence of the Information Ecology's *keystone species* feature, I noted how they developed the protagonist-mentor, or librarian "voice of reason," as a design solution to help guide players who did not know where to start.

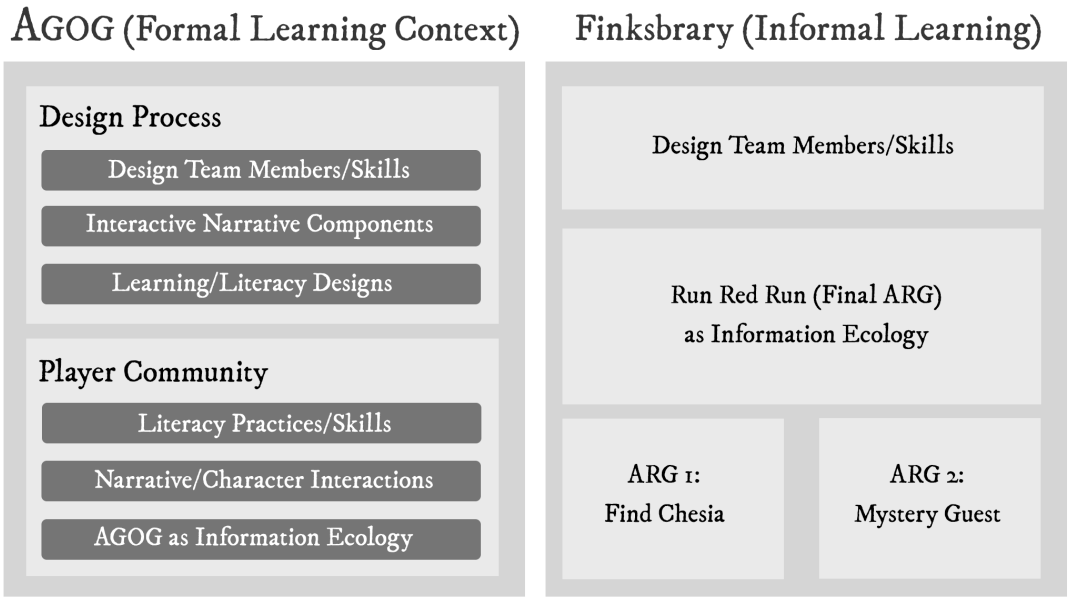


Figure 6.1: Reprint of Yin's (2003) embedded unit-of-analysis design, adapted for the *AGOG* and Finksbrary cases.
Sub-units for the AGOG case included the elements of cooperative learning that the AGOG team applied during design, with the related outcomes tied to the UMF "collaborating" skill. The sub-units for the Finksbrary case include the keystone species (e.g., the protagonist-mentor) that the team developed, the challenges of building a player community within a larger ecosystem, and the UMF literacies/skills that the teen designers themselves developed over time.

6.2.1 Finksbrary: Local Informal Learning System within a larger Library Ecology

Nardi & O'Day (2000) equated information ecologies with biological ecologies, which, simply put, are systems of interrelated components that depend upon each other to survive. While these are simple defining attributes, they help to situate the Finksbrary design case as a system of designers and the interactive experiences they created, as well as a small outreach component of a larger, public library ecology. As an element of the county library's Youth Services, the Finksbrary design team and their ARGs also operated within a local, informal learning context. As an information ecology, their *locality* was bounded by a specific purpose and timeframe (Nardi, & O'Day, 2000), because the team's goal was to design informal, out-of-school learning experiences that targeted existing teen library and potential library patrons during the summer. Ideally, any ARGs that the Finksbrary team

designed could attract and sustain teens and promote the ALA summer reading program and the ALA/AASL Literacies for the 21st Century Learner ((AASL) American Association of School Librarians, 2008).

Ultimately, as a collaborative, interactive "system" of librarian, teens, and library resources, the Finksbrary design experience exerted positive influence on the teen designers, who grew to become active members of their larger library community. They promoted their ARGs and contributed many volunteer service hours not just to the design of the summer reading ARGs, but also to support teen activities within the library system. However, as a test-bed that was trying to develop into a more sustained component of the library's outreach program, the Finksbrary case did not succeed beyond the short time Heather and Millie supported it. In this case, an awareness and understanding of the larger library ecosystem of which the Finksbrary team was a part was essential to ensuring its success. As Heather noted, when reflecting on the ways in which she was not able to involve other branches in her county library system:

> **Heather**: *There wasn't any tension about competing resources. It was more that we didn't get buy-in from all the branches. We wanted to make it county-wide, which course, involves all the branches. But we didn't really ask them directly if they wanted to participate. I think that is part of it. Also, with summer reading - you're already inundated with a lot of information and then to add information, especially on something that is...basically a game...that a lot of people did not see educational benefit in and/or library benefit. ... It just didn't seem feasible, especially in, in this economic climate, to be putting our time into -- basically, a game that's not being played by that many of our users.... Yeah. It was a **lot** of work. But we **enjoyed** it. We had hoped it would be bigger than it was...and although it was online, we really wanted to engage a **local** audience. But, we were not successful in doing that, and since that was our primary goal, it did not seem worthwhile to us to continue. Now I've seen other ARGs work, and obviously... we had constraints because we wanted to do it with teens and we wanted it to be applicable to teens* (H. Owings, personal interview, September, 2012).

Rosie attributed her team's recruiting issue to their rural community and the difficulties that many people have in understanding what ARGs really are:

> ***Rosie:*** *Oh yeah, we had like one person for Find Chesia. And they may* ***still*** *be going... "What? Yeah. What? I don't get it."* (Laughs.) *… But I think we didn't get many players for any of our ARGs, because... well, I've said that we're in [anonymized] County… We* ***don't*** *have a lot of people that have access to Internet or that really honestly* ***care*** *about ARGs. I think… we have a lot of people that are kind of – a little* ***close-minded*** *about Alternate Reality Games and are RPGs and stuff like that. A lot of people have a little bit of a bias against different ways of playing a game. Like, it's different from Monopoly and Uno and stuff like that. There's* ***not a board****. It's online – well, mostly online (laughs)… We didn't have people* ***against*** *it, but we had people that were really* ***confused*** *by it and didn't really understand. So... the idea was not very popular here. And … we also didn't have the money to be able to ... advertise and go "Hey!* ***This*** *is what it is, this is why we're doing it, even if you're not really sure about it, you should still at least try it. Hey, you may* ***fall in love*** *with it." … Like* ***we*** *did* (personal interview, January 2012).

Based on the small number of ARGs that have been developed in learning contexts, a key implementation issue to ensure success is to recruit an existing community (e.g., a class). For instance, two other ARG design teams targeting youth and young adults in informal learning contexts have had similar experiences (Sylvan, Larsen, Asbell-Clarke, & Edwards, 2012; Whitton, 2008). Despite a strong marketing plan and a robust mixed reality design, Sylvan et al. (2012) were not able to develop and sustain an adequate player base for their environmental science game for older teens (15-17 years old), *Canaries in a Coalmine*. *Canaries* had many of the same features as *AGOG*: an online player community site, multiple media (to include mini-games that were similar to the AGOG Order missions), badges awarded for completion of player challenges, and challenges and story element that were released to players over time (Sylvan et al., 2012). Although the registration page for Canaries logged 2000 – 3000 *visits* during its initial launch (August 2011), only 75 players actually registered; approximately 20 players posted content; and only 10 players engaged in the chat sessions required to advance the game's storyline (Sylvan et al.,

2012). Even after the designers revised and re-released the game based on lessons learned from the first release, "a sustainable community did not form" (Sylvan et al., 2012, p. 5).

Similarly, *ARGOSI*, an ARG that targeted new undergraduate students (18-21 years old), failed to recruit and sustain a substantial player base (Whitton, 2008). *ARGOSI* was designed to support new undergraduate students as they transition into university life and learn to use university resources at a university in the U.K. While several hundred students were targeted, only about 10-20 students completed the ARG. Professor Nicola Whitton, one of *ARGOSI's* designers, felt the lack of community buy-in was related to several factors, which echo comments made by the Finksbrary team as well as design strategies used by the *AGOG* team:

> **Nicola***: The system worked in testing, but then when we ran it live, we got quite a low initial response rate of about 200 students… and then of those students only about 5% actually properly fully engaged and there's a whole wealth of reasons for that. I think in terms of initial induction we did some market research and found that the marketing materials that we'd used which were taken around the "this is not a game" idea, so it was sort of cryptic postcards and posters and fliers and things like that, and people were...unsure. Also, we launched [at the start of the academic year], when students were being bombarded with other kinds of fliers from nightclubs and restaurants and so on, they didn't know that it was something different. They didn't take the time, and it wasn't associated with the university ...*
>
> **Interviewer***: It wasn't in any way compulsory then?*
>
> **Nicola***: Exactly, no and I think that's one of the things ... So part of it was the initial take-up, I think the timing was wrong and I think the way we marketed it was wrong and what we would do in the future is I think get involved with* ***specific lecturers*** *and use it in a* ***much more supported*** *way. And then I think there was a problem with people that did initially sign on, not continuing. So those who were engaged, they were really engaged, but I think it's possibly a case that these are pretty proactive people anyway so that they were going to get engaged whatever… these are also the people that would have gone off and learn how to use the university resources anyway, so it was* ***maybe not getting to the right people****. But I think another part of it was that, despite having done quite extensive testing on the first challenge, it was too difficult for quite a lot of people and that put people off. So, what I would do again, in terms of challenge design is make sure there are* ***lots of very easy, or getting more gradually difficult****,* ***different types of challenges*** *for people to engage with so they've at least got some buy-in*

> *very early on and sort of start seeing some very early rewards… We thought we'd done this in the testing 'cause we tested it, and everybody could do it, there was no difficulty… I think part of that was that people testing were* ***face-to-face****, so they were actually doing it in collaboration and that sort of collaboration didn't happen in the online environment, which was a design issue* (N. Whitton, personal interview, January, 2011).

In the same way that Whitton observed that new undergraduate students are so bombarded with information as they go through orientation that the *ARGOSI* marketing materials remained *un*-noticed, Kitty said that her peers would look at the *Invite Objects* that were part of their summer reading registration folders and think, "Cool!" but still would not take the first step to visit the game site (or even realize that they should). Similarly, Heather noted that librarians at other branches did not know to highlight the ARGs as unique entities for play, given how they were inundated with other information to share with their patrons about the summer reading program. Whitton also noted that adding more structured sponsorship by university lecturers could yield more players and help sustain their participation to the endgame. Likewise, the *AGOG* team worked closely with the middle school librarian and social studies teacher to maintain and sustain engagement, gradually increasing the difficulty level for each Order's mission, rather than require lots of community collaboration in the first set of challenges.

6.2.2 AGOG: Self-contained History Project within a Formal School Environment

In contrast to the lack of community that the Finksbrary team was able to build, the *AGOG* team benefitted from an *already established* community: two eighth grade social studies' classes, with strong support from the school's principal, history department chair, and librarian to implement AGOG for two weeks during class. From a human subjects research perspective, requirements did exist to ensure that the

AGOG team coordinated with the county public school system to collaborate with the school and to secure consent forms from parents of the teen players (as well as assent forms from the teens themselves). For the most part, however, building a community was not the critical issue for an ARG like *AGOG*, since it was conducted in the classroom. Similar ARGs implemented in classrooms, such as *The Mighty Fizz Chilla* (designed by 10-11 year olds for 9-10 year olds, Colvert, 2009) and *Black Cloud* (designed by university researchers for high school students, Niemeyer et al., 2009) also enjoyed the benefits of an existing player base.

Given that the player community was already established, the primary implementation issue that the *AGOG* design team faced from an information ecology perspective was to ensure that players were motivated to contribute and collaborate as individuals and as a community. To sustain player involvement and excitement, the *AGOG* team provided support and scaffolding with several different keystone species.

6.2.3 Keystone Species within the AGOG and Finksbrary Design Cases

As noted in Chapter 2, keystone species (i.e., roles) in ARGs can help players become and remain engaged as they progress from launch to endgame. There were several ways in which the *AGOG* and Finksbrary design teams designed and implemented keystone species to support players' engagement and collaborative sense-making. The following sections outline the primary keystone species (protagonist-by-proxy and protagonist-mentor) that were used in both design cases.

6.2.3.1 AGOG Keystone Species: April and the JENIUS Ambassador

Recall that as players progressed through *AGOG*, they discovered that documents they had been given access to held clues to a secret message whose pieces they had to collaboratively find, decode, reassemble, and share with April, the in-

game protagonist, who was charged with sending the final message that would help prevent a devastating reversal in historical events (i.e., changes in the outcome of the U.S. Civil War). April's primary function as a protagonist-by-proxy had emerged gradually throughout the design evolution of *AGOG*.

Midway through the design process, as the narrative and player challenges were being developed, the *AGOG* design team explored multiple design options to fragment and then distribute the narrative in ways that were accessible to teen players (e.g., with partial information on the community wiki, with clues embedded in facsimiles of historical documents). Most of these solutions, however, required that players take the initiative to find the wiki data or uncover the clues. As the *AGOG* creative writer, Ann Fraistat, noted in her post-game interview, these game elements required little "interaction" from players beyond reading about them. They covered the *JENIUS* mythology and backstory, but players could *not* directly interact with them as they could with a "live" character.

> **Ann:** *Since my first task was to create the "narrative bible..." it was like, oh,* ***yes****, I'll go write sort of like a history* ***novel****, y'know, for us, an alternate history novel and ... during all that backstory time, I wasn't really fixed on the [ARG]* ***format****. Then when we started talking about how to actually* ***design*** *this game and* ***incorporate players****. ... that inspired me to start looking at it from more of a gamer perspective and less of, well, I mean it's both, right? 'Cuz at first I just was thinking about what makes a good narrative, but there's two components to this so, what makes a good narrative and what makes a good game... and the real strength of [an ARG] is that it is* ***interactive****.*
>
> *… So, after I read* Cathy's Book*… [Cathy, the protagonist in Cathy's Book] made me think about-- for our* ***teen players****-- how it would be great to have some kind of grounding force. Especially I think that was necessary because you know, a lot of the narrative components in session one were more towards the mythology side of things, and* ***we had trouble reconciling all that mythology with the fact the players need to play this game and the mythology wasn't really playable.*** *So* ***April was at least a playable narrative element that we could put in there that would really ground it for middle schoolers*** *and it was important to me to try to make her cool, even in the setting of this, you know, like it's hard when you're trying to relate to some kids who you expect might be kind of like, "*eh, school, whatever.*" I*

> *was hoping to help* ***pull them in by having someone who they could relate to*** *a little bit. It was* ***really*** *important to me… April had a sense of humor but, y'know, was hopefully someone the kids would look up to a bit or y'know, want to be like her, was the idea… Y'know she's a* ***college*** *kid. Middle schoolers tend to think that's awesome. She was a writer, I thought about making her an artist in a nod to* Cathy's Book*, but I can't really draw very well, so I thought that could backfire pretty quickly (laughs)* (A. Fraistat, personal interview, June, 2011).

As a result, April Gravure ("April G." to players), *AGOG's* protagonist-in-proxy, was created. As noted in Chapter 4, April's main functions as protagonist-by-proxy were to share expository elements via videos and personal blog posts, to model effective information-seeking and sharing behaviors, and to encourage players when they had difficulties. Effectively, she shared in their efforts to decode various Morse-encoded and encrypted messages that would enable them to "save history" (as described by players during the end-of-game focus group and survey).

Figure 6.2: *AGOG* Middle-school players listening to April.
At least one-third of the players listened repeatedly to April's daily video blog about *AGOG's* mysteries.

Based on digital traces of player activity on the community site (logged in a database) and player responses to a post-game survey, April's video blog posts proved to be one of the most engaging *AGOG* design elements for players. They would often replay April's daily video blog posts multiple times to ensure that they uncovered all the clues they thought she might reveal to them. Figure 6.2 shows players watching (and re-watching) April's latest post.

In addition to meting out story events via almost daily videos and personal blog posts, April modeled information search behaviors that the players' librarian and teacher were trying to promote (e.g., see (AASL) American Association of School Librarians, 2008), and helped respond to players' requests for help via live, interactive chats with players (Bonsignore, Hansen, et al., 2013; Bonsignore, Hansen, Kraus, Ahn, et al., 2012; Bonsignore, Kraus, Visconti, Hansen, et al., 2012a). Almost 20% of the chat messages on the *AGOG* player community site involved players asking April for specific help on game missions and badges, or voicing their support. For example:

> **1) Henry >> April:** *"Hii April, my name is henry and these missions are hard especially cryptographer first mission"*
>
> **April >> Henry:** *"Hey Henry. Yeah, the one with all the morse code... People from the last class said you guys had some JENIUS people there today, right?"*
>
> **2) Ben05 >> April** *(asking for her help to make out the morse code sketched out in her notebook (a picture of which she included in a blog post): "As a chryptotographer, it is diffucult to read your morse code. please give mea hint"*
>
> **April >> Ben05**: *"Blake, here's the morse code broken down: -- . ...- --. . ... / .- -.-. .-. --- ... ... / - .. -- ."*
>
> **3) Kailee >> April:** *"hey how r u doin... i know im with u"*
>
> **April >> Kailee:** *"I'm doing okay--safe for now! How's training going?"*

> **Kailee >> April:** *"its goin ok for now! i saw ur video its great and ill do anything 2 help … i just need allitle help on my missions"*
>
> **Kailee >> April** (at end of a class session): *"yeee april nice talkin 2 ya!!!!!!!!!! talk 2 u 2marrow!!!!!!!!"*

April also provided an engaging and accessible means for following and piecing together the fragmented narrative and related factual historical elements (Bonsignore, Kraus, Visconti, Hansen, et al., 2012a). As evidenced by chat messages during the game, during the post-game briefing in which players engaged in a final live video chat with April, and in a post-game survey, most players exhibited a strong connection to their protagonist-by-proxy. In a post-game survey, several players noted that April was a major reason why they participated: "*I helped April G*"; *"I tapped the code for April"*; and "*April was in trouble and we had to help her."*

As *AGOG* creative writer Ann Fraistat noted, to support the players' perspective of April "as one of them," she portrayed April as a student. However, to support the middle school teens' aspirations to interact with older, more experienced youth, April was a 21-year old college sophomore. Her college-age status piqued the interest of several players: during the end-of-game focus group the research team held for *AGOG*, a handful of the male players inquired whether April had a boyfriend.

A fictional Ambassador to *JENIUS*, the secret society in which April and the research team working for the Smithsonian, provided players with guidance as the *AGOG protagonist-mentor*. The *JENIUS* Ambassador was depicted as an all-knowing leader in the society, and provided information to players at pre-scripted stages in the narrative. He introduced the players to the tenets of *JENIUS* (e.g., importance of respect for others and careful evaluation of information). He also delivered the game's Final Mission orders and presented endgame congratulations. Because the

Ambassador was characterized as a stereotypical authority figure, his interaction with the players was one-way only. He did not engage in dialogue with them, but presented direction via pre-recorded podcasts.

A secret society known as the Scientific Confederate Alliance for Revolution (SCAR) presented players (and April) with an *antagonist* organization who, like *AGOG's* protagonist-mentor, the Ambassador, never interacted directly with players, but were referred to indirectly in clues on the community site, or overheard in a conversation recorded by a hidden April on her phone. SCAR offered excitement and motivation for many players, as demonstrated in this excerpt from a player blog post (also shown in Chapter 4 as evidence for seeking collaboration):

> ***Ben**: "As you know, last week we observed April G's notes on her phone recording. The morse code translated out to be Message Across Time. This is obviously linked to the Kairograph, which can send messages in the past, present, and future**. SCAR is obviously on the hunt for this.** We need April to write that message on the 15th!!!!! **We need to work together for clues & find out why SCAR wants April.** You can talk to me about my blog at Ben05"* (blog post on the *AGOG* player community site, April, 2011).

The narrative-centric keystone roles that the *AGOG* team employed throughout gameplay included April, the *JENIUS* Ambassador, and SCAR. In addition, within the physical classroom, members of the *AGOG* team served as gamerunners who facilitated the whole group processing discussions, and pointed out notes that players had posted on the Wall of Evidence to encourage players from different Orders to collaborate. The combination of physical, in-class support from gamerunners and online support from ARG characters proved very effective for *AGOG*. This configuration of online and in-class support and scaffolding also echoes recommended practices for facilitators in formal, problem-based learning contexts (Hmelo-Silver & Barrows, 2006, 2008).

6.2.3.2 Finksbrary Keystone Species: The Librarian (fictional and real)

As noted in Chapter 5, for *Find Chesia*, the Finksbrary team attempted to follow the design principles applied to adult-based ARGs, but found that rather than engaging their target population of tweens and teens in a collaborative sense-making adventure, they were confused by the lack of direction and concerned with Internet privacy issues (H. Owings, personal interviews, November, 2010 and September, 2012). The following year, the Finksbrary design team developed the *Mystery Guest*, whose multimedia content was delivered primarily through *one* community website (Doh, 2010a, 2010b). Furthermore, the protagonist-by-proxy model that Finksbrary employed presented the teen designers as players themselves, who found clues and shared their thoughts and questions for the rest of the player community in more "natural voices" than the first ARG (H. Owings, personal interview, September 2012). Not only did the teen designers feel more comfortable, the target teen players also felt more connected to these in-game characters, given their closeness in age and vernacular (H. Owings, personal interview, September 2012). Heather also included an additional authoritative in-game character to help provide direction and guidance that *Find Chesia* lacked. The Finksbrary design team dubbed the librarian character as the "*voice of reason, to give hints on how you would...answer the problem, or how you might find the solution, or to suggest websites. They were things that we didn't do in the beginning, because we thought they could figure it out on their own*" (H. Owings, personal interview, September, 2012). With the addition of these keystone species, player participation jumped by a factor of four – to about 23 players total – with eight core players throughout the summer ARG (Doh, 2010b).

In the typology of keystone roles or species used by designers to promote and sustain player participation, I have included both *gameplay-centric* (designed for an emerging post-launch) and *narrative-centric* roles (designed pre-game, as part of the game's story world). From an Information Ecology and learning perspective, however, Heather also played a key role for the teen designers with whom she worked. As the head of the Finksbrary design team, Heather was very supportive of her teen volunteers, and sought opportunities for them to assume leadership positions in the design process. For example, here is an excerpt from the *Find Chesia* design wiki, in which Heather invites Kitty to lead a follow-on design session. Keep in mind that Kitty was 12 years old at the time Heather made the suggestion:

> **Heather***: Would anyone like to try facilitating (leading) the meeting? Kitty, you were doing a great job of this at the last meeting.*
>
> **Kitty***: WOW!! I'd really like to do that. Thanks sooo much!* (*Find Chesia* design wiki, August 2008.)

At the same time, Heather realized that a large part of her teen designers' contributions on the design wikis were more social than design-focused. Rather than quelling the teen designers' silly comments during design sessions or online, Heather allowed the team freedom to experiment and play:

> ***Heather****: And y'know, teens being teens, not all the communication* (on the wiki) *was towards the project. Some of it was just silly, but it kept them motivated throughout the month when we didn't have meetings or sometimes, not all of them could attend, so at least they could all attend online or follow the process of the building of the game online* (H. Owings, personal interview, Nov 2010).

During her interview, Rosie emphasized the many different ways that Heather and Melanie served as role models for her and her friends:

> **Rosie***: I loved Heather and Melanie. They were* ***fantastic*** *role models. I mean, like, they stuck with us through* ***everything*** *- I swear they must have downed... they must have gone through 6 of these really* ***HUGE*** *bottles of Advil in just one of the year's with us. They were patient.... They let us be like*

> *creatively as free as we wanted. And, if we had spare time after our meetings, they would just hang out with us.* (Personal Interview, January 2012).

Kitty even suggested that Heather and her band of teen designers contributed to her success in school:

> **Kitty***: They were a great creative bunch… They were all my friends and they were so part of my life… It was great. I probably wouldn't be graduating without them. It was fun to get together.*

Overall, Heather allowed her team to experiment and evolve as they designed. Another facilitator may have wanted the teen designers to keep Red alive to ensure that their ARG had a "happy ending," regardless of the number of players who contributed. Like professional ARG designers in the entertainment industry who do their best to respond dynamically to player input, changing the storyline as they react, Heather allowed her teen team to debate and determine various outcomes. In many ways, Heather's approach not only represented behaviors attributed to expert teachers (Hmelo-Silver & Barrows, 2006), she also followed a collaborative design process with her teens that is closely aligned with the democratic philosophy of participatory design, wherein the target user audience is as closely and equally involved in the design of new technologies as a more "professional" design team (Bonsignore, Ahn, et al., 2013; Druin, 1999, 2002; Muller, 2008; Schuler & Namioka, 1993).

6.2.3.3 The Potential of Keystone Species

Both the Finksbrary and *AGOG* design cases offer specific strategies for using the protagonist-by-proxy and protagonist-mentor to engage players and promote their sustained participation. In particular, they highlight strategies for designing a protagonist-by-proxy who has characteristics that are relatable to an ARG's target demographic. For example, April was a student, like the *AGOG's* middle school

players. However, she was also slightly older and wiser (college sophomore), someone who the players might aspire to in high school and beyond. She also used the same media channels that *AGOG's* players, and her video blogs were created with a homegrown, hanging-out-in-my-bedroom quality that is familiar to most teenagers. Similarly, the Finksbrary teen designers who acted as proxy players in the *Mystery Guest* were both more comfortable and more accessible to their peer player audience. Finally, April was a model for the learning behaviors that *AGOG* was trying to promote. She would explicitly guide player actions, giving them new story information and ideas for what to do with it, as well as summarize the "story so far." In short, April provided the positive feedback that Jafarinaimi et al. (JafariNaimi & Meyers, 2015; Jafarinaimi, Meyers, & Trumble, 2014) found missing in their analysis of the design weaknesses of *WWO* that limited productive player participation practices.

Like player-produced game resources that enable non-players to access and enjoy distributed, often complex ARG narratives (Dena, 2008a), the protagonist-by-proxy and protagonist-mentor roles offer mechanisms for players from more diverse backgrounds to access and learn from ARG content. In effect, these key roles, when well framed and implemented, can help designers create experiences that fulfill the collective intelligence, participatory learning promise that many ARG proponents have touted.

6.2.4 Prescriptive Design Implications Using the Information Ecology framework

While the Information Ecology framework may help to describe and synthesize key characteristics of the Finksbrary and *AGOG* design cases, its capacity

to offer prescriptive design implications is limited regarding ARGs and interactive transmedia experiences that target teens in learning contexts. When Nardi & O'Day (2000) developed their framework, their aim was to characterize how emerging information systems and information technologies were appropriated and modified by users and designers in different contexts, such as libraries, hospitals, high schools, and even a virtual world. Their rich, ethnographic descriptions underscored the importance of recognizing the keystone species that sustain and advance information ecologies, the local contexts in which different technologies thrive or decline, and the ways in which diverse stakeholders can co-evolve together. While their characterizations shed light on the technological features and types of people that make different information ecologies tick, no design implications were proffered. Importantly for design cases like Finksbrary, such descriptive analyses may highlight the challenges that arise, but do not always signal possible design solutions. My analysis employs the Information Ecologies framework to derive specific design implications for ARGs, with a focus on those implemented in learning contexts for teen audiences. Specifically, I have applied the "system" and "locality" features of the Information Ecologies framework to the ARG design space by highlighting the *AGOG* and Finksbrary designers' considerations regarding the larger systems within which their ARGs were implemented. Effectively, in informal, out-of-school contexts, community-building challenges may be more difficult to overcome than in formal contexts. With regard to the "keystone species" feature of an Information Ecology, I have described the ways in which the *AGOG* and Finksbrary teams developed ARG characters and supporting players that are both *narrative-centric* and

gameplay-centric. Beyond these specific extensions of the Information Ecologies framework, what additional design patterns can the *AGOG* and Finksbrary design cases offer to future designers, practitioners, and researchers?

6.3 Extending the Information Ecologies Framework

My analysis of Finksbrary and *AGOG* design cases reveals several opportunities to add prescriptive design recommendations for ARG designers using the Information Ecologies framework. In this section, I develop the notion of ARGs as a specific type of information ecology, that of an *interactive narrative* system, and include strategies and questions that designers may use to promote player engagement and active participation in generating their own story extensions. I also summarize the ARG roles framework that I have developed through analysis of existing ARGs (Chapter 2, *section 2.3.4*) and the *AGOG* and Finksbrary design cases. Finally, I synthesize the lessons learned from *AGOG* and Finksbrary into design strategies for future designers and researchers, using the key features of ARGs (transmedia interface, participatory narrative, and authenticity).

6.3.1 ARG Narrative Design Dimensions and Framework

As noted by experienced ARG designers and members of the *AGOG* and Finksbrary design teams, narrative is a core element of ARG design and game play. Ultimately, the primary player interaction mechanism in ARGs is a distributed, transmedia story. One avenue for extending the Information Ecologies framework for ARGs is to focus on the narrative sub-system that is the heart of the larger ARG eco-system. Because the designers' initial storyline is not the only story told through ARG gameplay, I was interested in how designers try to craft stories that allow players to

contribute dynamically to them. As players weave their own hypotheses, interpretations, and extensions into gaps they perceive in the unfolding storyline, the ARG effectively becomes a collective narrative. As shown from related studies of ARG gameplay, ARG designers monitor player response in real-time and often modify the storyline based on player speculations (Dena, 2008a; J. Y. Kim, Allen, & Lee, 2008b; A. Martin et al., 2006; McGonigal, 2008a). Ongoing summaries that players compile on "the story so far" can act as a guide for new audiences and a ready reference for existing players and even designers (Dena, 2008a; J. Y. Kim et al., 2008b). The most successful ARGs represent a participatory culture, where players "actively participate in the creation and circulation of new content" (Jenkins et al., 2006, p. 207).

As an ARG unfolds, its puppetmasters must engage players to access and follow various story paths, as well as afford players opportunities to add their own voices. How do ARG designers and producers manage these interleaving storylines? How do they determine the essential elements of the story to start with? What design considerations guide their decisions about how, where, and when to distribute these nodes across their planned story network? How do they incorporate narrative hooks that invite potential audiences to play? In searching for ways to apply the *systems* and *co-evolution* elements of the Information Ecologies framework to ARGs and transmedia experiences in learning contexts with a view towards design rather than description, I analyzed the ways in which designers perceived the transmedia narrative formats that they were creating, *during* their design process.

Responses to these questions were synthesized from the interviews of the diverse set of designers listed as a data collection source in Chapter 3. Some of the designers who participated have been producing ARGs for over a decade; others have created only one ARG. Some of the topics that they covered during interviews included the challenge of recruiting a cadre of players to a genre that prides itself in being hidden and challenges of preserving narratives that cross multiple platforms and timeframes (all themes that have recurred throughout this dissertation study). Given the range of production contexts of the interviewees, the coding goal for gaining narrative design insights was to glean commonalities among the ways in which designers employed a variety of media and platforms "to enact a network…binding separate content into whole, coherent expressions" (Ruppel, 2009, p. 283). Many of their comments highlighted the tactics they used to structure narrative "through-lines" across media and platforms (M. Jones, personal interview, December, 2010). The resultant story-specific themes include 1) options for narrative structure and 2) approaches for engaging player participation (Bonsignore et al., 2014).

6.3.1.1 ARG Narrative Structures and/or Forms

All of the designers contrasted ARG narratives against "deeply-architecturally-sophisticated" content that designers "*build in, like books or films*" (J. Gee, personal interview, October, 2010). Instead, ARG narratives are unique structures that "***leave space*** *for the player to feel that their choices make a difference*" (J. Gee, personal interview, October, 2010), or motivate the player community to "*make sense between subplots, and make linkages...to the main story*" (N. Whitton, personal interview, January, 2011). These views establish a narrative ecology with

two main story types: the *designer's macro-story* and the *players' collective micro-stories*. From the perspective of ARG designers, the macro-stories they orchestrate can be situated along a continuum, with two distinct structures at each end: an open-ended, "thinly" plotted spine versus a close-ended, "thickly" plotted graph-like network.

A narrative structure of thickly plotted narratives can resemble a dense graph of story elements. The term "**close-ended**" emphasizes that much of the macro-story is crafted *pre*-game, with ARG designers orchestrating players' progression toward a preconceived endgame. Player interaction is driven by puzzle-solving and sense-making activities. In **closed/thick** ARGs, the narrative goal is collective *re-construction* of the macro-story, driven by individual player interpretations (micro-stories) of the distributed transmedia fragments. In contrast, a single "*What if*?" theme drives player interaction in **open-ended** ARGs. Recall that designers for *World Without Oil* asked players to simulate 32 weeks of a global oil crisis, inviting them to share personal stories about how their lives would change in such a world. In these participatory storytelling systems, the motivating theme acts as a single ("**thin**") central thread about which players weave their own meaningful micro-stories. The shared, emergent narrative is directly *co-created* by the player community. At both ends of the spectrum, designers must devise ways to balance authorial intent and player contributions: "*it's a continuously important issue with ARGs. How do you make people feel they have an impact and voice without letting them say Hamlet would be way better if it had a happy ending?*" (S. Stewart, personal interview, December, 2010).

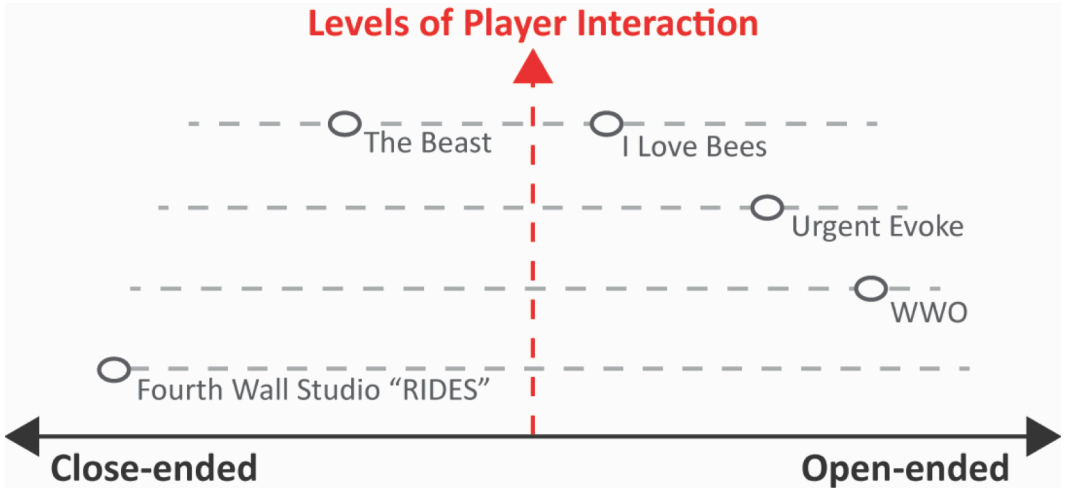


Figure 6.3 ARG Narrative Design Dimensions (Continuum of Open-ended to Close-ended).

Figure 6.3 depicts this ARG narrative design continuum. The horizontal axis reflects the close- to open-ended narrative design dimension. The vertical axis reflects narrative scope, or levels of player interaction (e.g., number and types of transmedia elements, puzzles/clues, etc.). As described in Chapter 2, Fourth Wall Studio's *RIDES* were highly orchestrated transmedia narratives[25]. Player interaction was scripted and fairly passive (e.g., reading an incoming text message). *RIDES* were an experiment conceived as the "album" solution to elaborate, live, "rock-concert" ARGs, and were intended as a "*product that is **not** ephemeral...a replayable, single player cross-platform" experience*" (S. Stewart, personal interview, December, 2010). In contrast, *WWO* was very open-ended, allowing each player to contribute to the story in her own way; using whatever media she was comfortable with. *The Beast* and *I Love Bees* contained many transmedia story elements (high player interaction required) and played out toward a preconceived endgame with a balance of scripted and player-

[25] As of summer 2015, Fourth Wall Studios' Rides, or "ARG shorts," had closed and its associated websites and video properties are no longer accessible directly. Here is one snapshot of the site from the Internet Archive Wayback Machine: https://web.archive.org/web/20121127082021/http://rides.tv/.

enacted plot points. If we overlay *AGOG* and the Finksbrary ARGs onto this narrative design continuum, they are situated toward the close-ended, designer-orchestrated end, as are several other ARGs that target youth in learning contexts (Figure 6.4). This analysis suggests that more structured narratives may be more effective in learning contexts.

6.3.1.2 Strategies for Player Engagement: Points of Convergence and "Gaps"

All of the designers who were interviewed emphasized embedding actionable tasks into the ARG's macro-story to promote active player engagement. Many of their techniques can be described as *points of convergence* where distributed narrative

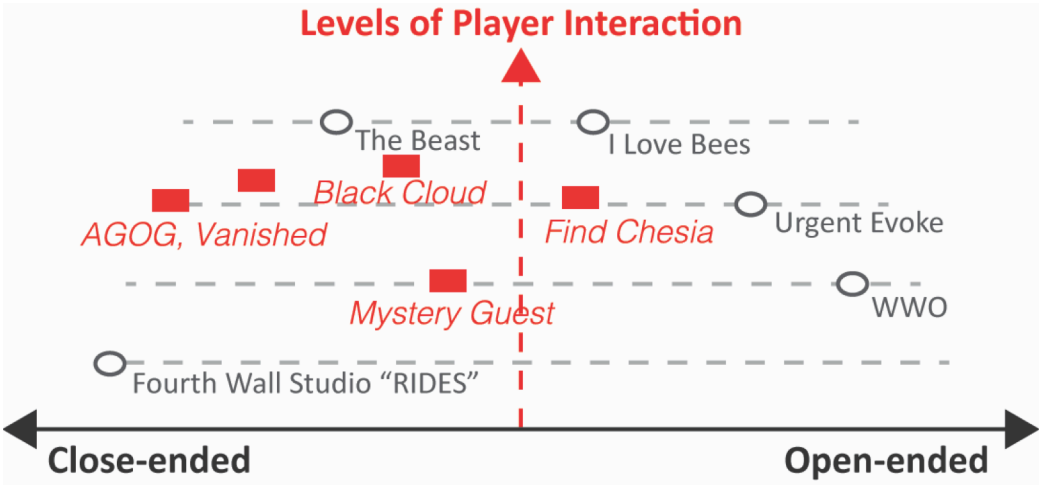


Figure 6.4: ARG Narrative Design Dimensions, with ARGs in learning contexts highlighted. The ARGs listed with red rectangles are ARGs that have targeted youth (11-17 years old) since 2009.

elements and game mechanics intersect. Based on designer interviews, the most important approaches to narrative design revolved around the following questions:

- *What action-oriented tropes can be embedded in the story to help players see themselves as active participants?* "Secret societies" were used to motivate players to "join" the game, and to reinforce required actions, such as

decrypting codes. *AGOG's* Jenius Academy, *Pheon*'s Staves and Knaves, *the Beast's* Cloudmakers, *MetaCortechs*' meta-urchins all represent special communities "in-the-know" about their ARG's special narrative backstory. An in-game character asking players for help and providing expository information is another oft-used narrative convention. *AGOG*'s April, *Find Chesia*'s Chelsie, the teen volunteers in *Mystery Guest*, even Red and her grandmother each initiated interaction with players as a plea for their help in resolving a mysterious conflict.

- *How can we bring the real-world into the story in an authentic way?* Several designers highlighted the need to integrate real world constructs and social contracts, such as connecting players to the micro-stories in a museum repository through missions. They expressed a need for players to role-play for "real," such as having an urban planner evaluate player plans or guild members meeting up at a specific location to complete a mission (Goodlander, 2009). As Georgina Goodlander, former Smithsonian American Art Museum curator noted: "*We incorporated bits of our museum's history. It made it so much more real to people… That's where you really succeed in blurring that line*" (G. Goodlander, personal interview, August, 2013).
- *What are essential nodes that must be traversed?* Regardless of whether they produced close-ended or open-ended ARGs, all designers highlighted a need to help players find a consistent "*through-line*" (M. Jones, personal interview, December, 2010), or "*ways to define [stable] islands of stuff that you're sure*

of – and other assets that you can create and destroy very, very fast" (S. Stewart, personal interview, December, 2010).

In addition to these points of convergence, designers noted that *gaps*, or *absence of narrative information* were important, and especially critical in open-ended ARGs, whose emergent storylines rely on inciting player contributions. Such gaps can be described as counterfactual design, a mechanism that motivates players to imagine "what if" scenarios to fill in gaps in close-ended narratives or add nodes to open-ended ones (Bonsignore, Kraus, Visconti, Hansen, et al., 2012a). For example, *WWO* designer Ken Eklund noted, "*What is the vacuum I create that allows the story to be told?*" For *AGOG* creative writer and April actress, the vacuum that could compel players to contribute to an ARG narrative was embodied in counterfactual gaps in history (Bonsignore, Kraus, Visconti, Hansen, et al., 2012a): "***every** time historians say, we don't know how this happened or we really can't explain this, I would mark it*" as an inflection point ripe for player intervention. Such tactics reflect the evocative power of ambiguity for interactive designs (Gaver, Beaver, & Benford, 2003).

Several designers also noted that the points at which they left gaps in their narrative proved to be an incentive for players to document the macro-story for others, or to enrich it with their own micro-stories: "*If you have a sufficiently large audience, they will filter and do quality control. The players do it for you; they do it better; and they are infinitely more painstaking and careful assembling and documenting how well the pieces go together*" (S. Stewart, personal interview, December, 2010). Indeed, Dena's (Dena, 2008a) analysis showed that player

productions are often more popular to broader audiences than designer macro-stories. This suggests a potential touch-point for future designs that can enable players to participate in the production and preservation of their own participant trajectories, thereby increasing the community archival power for an interactive art form that has been heretofore largely ephemeral.

This analysis on narrative design extends Benford et al's (2009) trajectories framework, which describes user experiences of performance artworks as designer-orchestrated journeys. While Benford et al. (2009) acknowledge that a player's journey is "*shaped by narratives that are embedded into spatial, temporal, and performative structures by authors*" ((Benford et al., 2009, p. 712), they do not explicitly unpack *how* designers can embed and distribute narrative elements to invite active story input from players in authentic ways. Many existing game designs offer players optional paths to change their gameplay experience (Salen & Zimmerman, 2003); however, the ARG designers who were interviewed sought ways for players to incorporate *new, player-produced* content into the macro-narrative frame. These approaches complement examples that explicitly had players add their own micro-stories to the orchestrated narrative. As two examples, Benford et al.'s (2009) designs for including player-*selected* (not produced) content are represented in their 1) *Thrill Lab*, where participants would select a souvenir image or short video of themselves experiencing a *Thrill Lab* amusement park ride; and 2) *Day of the Figurines*, in which players would select a physical figurine that would represent their "character" in the macro-story. The ARG designers' strategies for player engagement emphasize participatory storytelling, which acts as a foil to Benford et al.'s trajectories

framework because they underscore the allure of gaps and ambiguity to inspire players to *contribute* to a collective story, not just interact with it. This insight may be unique to ARGs in that it overtly allows for players to subvert the hierarchy of authority that Benford et al.'s framework suggests with its language of "canonical" vs. "participant" trajectories – players are given more equal footing with puppetmasters in the most open-ended ARG narratives.

6.3.2 Keystone Roles Used by ARG Designers

In this section, I provide a brief summary of the keystone roles that I identified through analysis of existing ARGs and applied to *AGOG* and Finksbrary design cases in *section 6.2.3*. Prior studies have analyzed player participation patterns to derive their role sets from the roles and behaviors that *players* and player communities assume to collaborate and support their own engagement (e.g., (Jafarinaimi et al., 2014; A. Martin et al., 2006). In contrast, my study shifts its analytic focus to the ways in which *designers* endeavor to create and employ characters within the ARG narrative to promote participation and collaboration. I have identified five types of *keystone* roles that designers have developed.

- *Narrative-Centric, defined pre-game*. These roles include characters who are integrated into the narrative pre-game and whose social roles remain distinct from players throughout gameplay. Three social roles fall within this category: 1) the "*Protagonist-by-Proxy*", a character who is part of the overall narrative but works as a close ally and informant to the player community (M. Anderson, 2008); and 2) the "*Protagonist-Mentor*" who acts as the ARG's help system and authority figure, often directing the players to complete

specific missions and offering training or advice that enables them to do so; and 3) the "*Antagonist*" (whether an individual "villain" or organization), that can serve as a primary source of conflict to engage potential players to participate and existing players to become more invested in helping the protagonists (Keen, 2003; Zillmann, 1995).

- *Gameplay-Centric, designed for and emerging post-launch*. These ARG social roles may be established and assigned pre-game, but very little narrative content or player interaction is developed pre-game. These roles are activated for engagement after the game is launched. Members of the ARG design team who assume these gameplay-centric roles have been dubbed *Gamerunners*, since they essentially drive gameplay once the ARG is launched. Two social roles fall within the *Gamerunner* category: 1) *Community Conduits*, who are responsible for dynamically reporting player activity to designers; and 2) *Planted, or Proxy Players* who may be introduced as characters within the narrative, but who interact with the player community as insiders and often, player role-models and guides. Phillips (2012, p. 153) has called these gamerunners and planted players *sock puppets*: *"…a sock puppet is intended to look like a genuine player in the community, but in reality it's someone on the production team…masquerading as an audience member for the purpose of pointing out key pieces of information, or giving those in the audience solutions when they get stuck*" (p. 153).

It is important to note that the support functions that all of these social roles provide are not unique to ARGs – other studies have identified individuals who serve similar

roles in promoting community goals and sustainability, such as founders/leaders (Kraut & Fiore, 2014b), mediators (Luther, Fiesler, & Bruckman, 2013), and elders or mentors (A. J. Kim, 2006).

6.3.3 Design Strategies Derived from Unique ARG Features

In this section, I summarize lessons learned that resulted primarily from *AGOG*, as I had rich data from both the design and play process. Where applicable, I include lessons learned from the Finksbrary design case (e.g., in the recommendation for one player community site in ARG designs that target youth in learning contexts). These combined lessons learned highlight specific design options for designers and educators that extend *beyond* the Information Ecologies framework by categorizing the strategies using the ARG features of *Transmedia Interface, Participatory Narrative, and Authenticity*.

6.3.3.1 Transmedia Interface

Use one player community site, with narrative distributed across multiple media within the site, to support youth privacy and technology literacy practices while simultaneously maintaining the sense of puzzle-like transmedia that is a staple characteristic of ARGs. In most ARGs that have been targeted for adults, the quantity, variety, and distribution of media used to craft the storylines is high. In contrast, both the *AGOG* and the Finksbrary team experiences showed that in learning environments (regardless of whether they are formal or informal), it is beneficial for players' understanding if you limit the number of sites that contain story fragments. At the same time, *AGOG* players had little problem working with the variety of multimedia that was used to deliver story fragments within the single JENIUS community site. Indeed, the use of different media by different characters seemed to increase the teen

players' immersion in, and engagement with, the storyline and its associated activities. One factor in *AGOG's* success was the way the design team matched the media type used to deliver the story fragment to the character presenting it. The Ambassador was an authority figure who could dole out mission assignments and make assessments. As a result, his interaction with players remained one-way only (recorded podcasts, memos). In contrast, April's video blog posts were personal and conspiratorial, and she chatted dynamically with the players throughout the game. The private community site also provided a shared, safe public space for players to discuss their ideas about the story, to post solutions to clues, to ask for help when they were stuck, and to celebrate when they finished missions and earned badges. In the Finksbrary case, a single site improved player participation, and the use of multiple media supported engagement and immersion (images, video blogs by the teen volunteers, music podcasts, and text) for their small group of active players.

Use one player community site (or limited points-of-entry) to support formal school Internet policies and reuse of educational resources. From an infrastructure standpoint, having a single, private in-game player community site supported school information technology policies regarding the number and types of websites that students are allowed to access from school ("Children's Internet Protection Act," 2011). None of the external websites that *AGOG* used were of concern; however, maintaining links to external sites at a central web location (the community site) helped to ensure that a school librarian and teacher could organize and manage them more easily. The community site may serve as a useful assessment and reusable lesson-planning tool: it provided a repository of player performance that could be

used in formal academic assessments, and has potential to be reused by teachers from year to year. For informal learning contexts such as the Finksbrary library, this strategy would also alleviate parental concerns about Internet safety and librarian concerns about having to maintain multiple distributed resources.

Take advantage of open source social media tools (e.g., CMS like Drupal; video-sharing sites like SchoolTube), rather than more complex virtual environments (e.g., Unity 3D). ARGs remove traditional videogame requirements to remain tethered to a desktop or to invest in specialized tools and skills necessary in virtual environments. Educators can appropriate relatively low-cost social media technologies such as blogs, podcasts, and online community tools like wikis and discussion forums to support the creation and distribution of narrative elements, and students can use these same tools to share their progress through the game. For *AGOG*, each member of the team was able to update his/her mission challenges, post proxy player blog posts, and chat with players without additional training or technical assistance. For Finksbrary, Heather and her teens were able to quickly establish player community sites and focus on developing content, and teen players could easily send chat messages to the protagonist-mentor characters (e.g., the *Mystery Guest's* librarian or Red's grandmother).

6.3.3.2 Participatory Narrative

Offer players the same media production tools that in-game characters and designers use to deliver content, to help maximize player participation and engagement. AGOG's players not only enjoyed interacting with the various media that the in-game characters (like April and the *JENIUS* Ambassador) used to present the storyline, they also took opportunities to use these same media to engage in their

own productive literacies (Squire, 2006). For example, all the *AGOG* players created and posted a video blog of their initial *Junto* oath, which was the same oath they witnessed April take in one of her early video blogs. This small video production represented the first opportunity that many players had to create, upload, and share a personal video on a community site. Almost half of *AGOG's* players (24 students) created at least 2 blog posts, and a few of whom began to use the same conversational, conspiratorial style that April's blogs had as they summarized and reflected on the game's progress. Every *AGOG* player posted at least one chat message. One player posted 72 messages to decode clues as she interactively chatted with April and members of the design team (who acted as proxy players). These findings suggest that ARGs for teens can and should afford players with multiple media tools to share their knowledge. This also aligns with recommendations from new media and participatory literacy frameworks (Jenkins et al., 2006).

Establish guidelines for in-game collaboration, so that teen players can enjoy social features such as interactive chat while they complete game-based missions. Many *AGOG* players used chat to participate in ways that supported teenage social needs, but not the explicit academic requirement to engage with mission-based learning activities. Five students who sent over 30 chat messages during gameplay used the Status Wall only to socialize with friends. The high number of social messages did not detract from the player experience, but neither did it support player efforts to solve puzzles and meaningfully advance the narrative. Laying ground rules for positive social interaction has been recognized as a standard design guideline in more adult-oriented ARGs (Bonsignore, Hansen, Kraus, & Ruppel, 2012; McGonigal,

2011), and can help simultaneously support a sense of community and productivity. For example, players in Urgent Evoke created their own code of ethics (DeBello, 2010), which also reinforces the UMF literacy skill, "Respect" (Figure 2.5). After her teen advisory boards informed her that it would be helpful for them to a web-page or section on the ARG site that contained information on how to play, Heather worked with her team to develop a brief, humorous "*Rules for Game Play*" for both *Mystery Guest* and *Run Red Run.* Below is a sample of the rules that she and her teen designers posted:

> ***Keep it clean**. Treat others the way you want to be treated. We have no need for a flame war - libraries are flammable! (Think of the books!) And don't encourage the flamethrowers, they tend to backfire.*
>
> ***Play for real**. We're all here to have fun but not at the expense of others. Violators will be smacked down with Art History books. (The average Art History book weighs 7.5 pounds. We wish we were joking!)*
>
> ***Make your point clear** when you comment. The Ethiopian language has a symbol to represent sarcasm. English does not.* (Mystery Guest ARG site, http://mysteryguest2010.blogspot.com/2010_05_01_archive.html.)

In future ARGs for teens, options for establishing guidelines include: 1) incorporating it into the narrative and missions (e.g., secret society code of conduct) and 2) reinforcing them through the protagonist by proxy (e.g., April).

Include a protagonist by proxy who acts as both peer and guide, to motivate active participation and engagement of teen players. Depending on the level of interaction and guidance required, an authoritative protagonist-mentor is also recommended. This has been covered in detail in section 6.2; however, here are a few specifics actions that April took during the game that modeled the literacy skills that the *AGOG* design team tried to demonstrate to players. When players needed help to negotiate the narrative and complete missions, April pointed them to wiki resources

that could help them solve puzzles and reassemble the fractured storyline. Players could use *sample wiki entries* and blog posts that April created as *templates* for their own work. Via the Status Wall, she encouraged players to collaborate amongst themselves and work closely with members of the design team who facilitated in-class work. Viewed through a participatory learning lens (Jenkins et al., 2006), the protagonist by proxy can be used as a narrative device to model productive information-seeking and problem-solving behaviors that teen players can emulate. In addition to the protagonist-by-proxy, the other narrative-centric keystone role that proved indispensible for the Finksbrary team and motivational for the AGOG players (in terms of badges and missions) is the protagonist-mentor.

Give players agency to help the narrative progress, through their dynamic interaction with in-game characters and required puzzle-solving tasks. As noted in *section 6.3.1*, many ARGs are open-ended, asking players to *co-create* a narrative. In contrast, other ARGs are more close-ended, with players responsible for collectively making sense of and *co-constructing* a fractured narrative arc that has been hidden by designers *pre*-game. Both are viable ARG narrative structures, but the participatory trick in close-ended ARGs like *AGOG* lies in the ways in which designers deliver story fragments incrementally over time in response to player interaction. There is no guarantee that every fragment will be found or used, so players continue to feel as though their actions can influence the story. In *AGOG*, the pre-seeded wiki entries provided both backstory and open-ended opportunities for the players to contribute as they learned more from April and gradually acquired more Order-related skills. The ARG still seemed participatory and dynamic, and narrative advancement was

propelled by traditional ludic elements such as collecting clues, solving puzzles, and helping in-game characters. *AGOG's training phase and live interaction with April* contributed to the teen players' sense that their participation made a difference.

6.3.3.3 Authenticity and TINAG

Enable teen players to take on personally meaningful roles while still interacting with the narrative and game content ***as themselves****.* The *JENIUS* Orders proved to be a device that allowed the teen players in *AGOG* to *choose* what types of contributions they wanted to make personally (e.g., do I prefer interacting with maps, writing stories, decoding puzzles, or inventing and building things?) and *contribute* to specific *team goals* within the overarching storyline and player challenges. Membership in the Orders promoted active participation and gave a sense of authenticity to their gameplay. In their post-game survey and in chat logs, I found that a substantial number of players identified with the roles they assumed during the game (e.g., "*I was a beast archivist*" and "*I invented things*"). Others enjoyed the variety of tasks they could participate in: "*there were many jobs we could choose from.*" Most of them felt like real detectives, and worked hard to complete challenges, ask for, and give help (e.g., "*i got past my first mission!!!! with help from Beth and Megan. Getting on at home!!).*

Make time for group processing discussions to help teen players distinguish between factual and fictive information presented in an ARG. Like the chat feature, TINAG proved to be a double-edged sword for *AGOG*'s players, as well as the Finksbrary teen designers and players. Live chat sessions with April gave *AGOG* players a strong sense of immersion, but they also contributed to some players' complaints about the effort needed to distinguish between factual and fictional

information. During *AGOG's* group processing sessions, a handful of students asked the design team to tell them "the answers" about which data were "real," and which were not (Lesh, 2011; Visconti, 2011b). On the positive side, these group processing sessions engendered rich discussion and debate about ways to question and evaluate information rather than simply accepting it, suggesting that designers of education-based ARGs for teens should take advantage of these teachable moments and build in "sense-making" discussion time. Because TINAG proved both engaging and confounding to the teens, designers should look for ways to hold dedicated how-to discussions on the critical evaluation of information (e.g., an online TINAG discussion forum, an "unsolved mysteries" category in a wiki repository, or face-to-face processing time, as was used during *AGOG*).

Experiment with various visual features that can signal to players in learning environments that they must judiciously question and evaluate the information they are finding. The *AGOG* team used visual and text-based "markers" to help players evaluate information and distinguish between factual and fictive elements within the ARG narrative, in addition to holding group discussions and getting protagonist by proxy help. For example, fonts were changed in online resources to help players to distinguish a transition between "fact" and "fiction." In addition, the player community wiki included "public" (based on available historical data, so "fact") and "private" (questionable data available for counterfactual play, i.e., "fiction"). These markers met with mixed results. While a few *AGOG* players recognized the "public" and "private" sections on the community wiki, most did not respond to them as much as *they heeded April's advice* about what information to look for and evaluate. One

possible explanation for this mixed result is that many of the wiki entries were not central to the final mission or training tasks. Consequently, not enough *AGOG* players noticed these features to be significant. In the Finksbrary case, the teen designers were proud of their efforts to signal a transition between "real Red" walking in the woods to "lost Red" with a video change from color to black and white. However, they did not receive feedback from any players that this transition was recognized. These types of visual signifiers and indicators may be more akin to subconscious (subversive?) visual aesthetics rather than effective visual literacy tools.

6.3.4 The Importance of Visual Tools

Novelists, screen-writers, and game designers often discuss their efforts at world-building and narrative design in visual terms, such as "narrative arc," layers, levels (Barthes & Duisit, 1975), and narrative architecture (Jenkins, 2004). Even the mind maps and story maps that are used by language arts educators in K-12 formal education environments offer visual tools for young authors (National Council of Teachers of English (NCTE) & International Literacy Association (ILA), 2016). As seen by the flow charts and narrative network diagrams used by the creators of *MetaCortechs* and *The Beast* in Chapter 2, ARG design is no different (see also (Dena, 2008c). As Heather and her team grew more experienced throughout their three-year design evolution, they relied on visual representations for their ARG storylines and the points at which players would interact with those story lines. In some ways, their discussions echoed the comments made by experienced ARG designers and researchers regarding the "*points of convergence*" where players would have to come together to solve challenges (e.g., What are the different ways we can

get the *Mystery Guest* back into his book?). Similarly, the *AGOG* design team's sketches and descriptions of the individual Order challenges and final mission (Figures 4.2 and 4.3) resemble the same network-oriented and path-planning flow charts that were used by the designers of *ILB* and *The Beast*.

When the Finksbrary team began developing *Find Chesia*, the types of images that they posted on their design wiki were focused on the artifacts that players would gather information on in online databases and collect within the physical library. The design team posted images of the gems that Chelsie noticed in her bracelet and the map with a hidden skull. Heather posted one "story map" file that she had found in lesson plans for language arts classes; however, the team did not use it during the design of Find Chesia. For *Mystery Guest*, the team posted few images, focusing instead on the creation of videos. The few images that were posted on their design wiki included *Mystery Guest* logos and one photo of their *Find Chesia* lessons learned design session. In contrast, the designers for *Run Red Run* posted the most photos overall (17 images versus 11 for *Find Chesia* and four for *Mystery Guest*). Furthermore, almost of the photos posted during *Run Red Run* depicted some visual representation of the ARG's narrative elements and the player interaction points. See Figure 6.5 for two ARG design documents, one from Finksbrary and one from *AGOG*, that reflect the highly visual nature of ARG narrative design. Just as there are tools that support the creation and distribution of screenplays and other creative writing endeavors, there is a need for tools that support the visualization of the narrative and interaction design elements of ARGs.

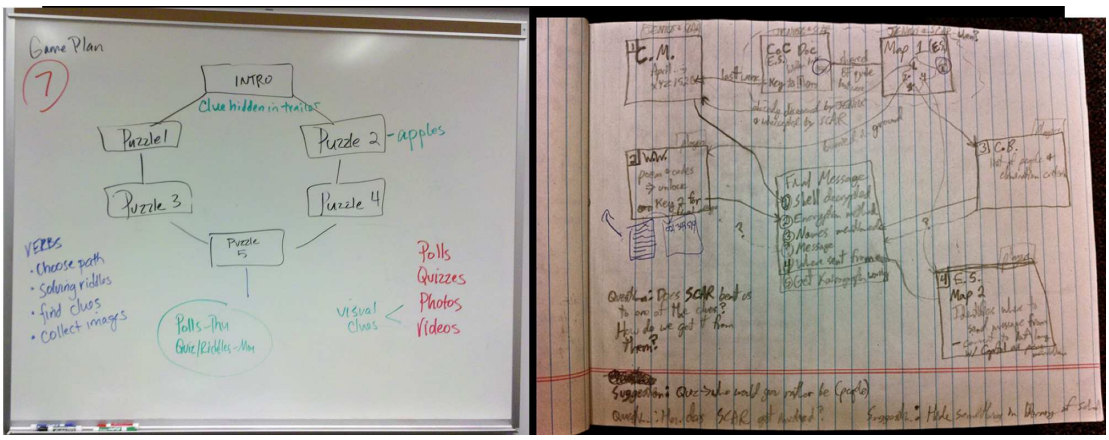


Figure 6.5: Visual Diagrams for ARG Narrative Designs.
On the left is the narrative and puzzles diagram for Run Red Run; *On the right*, AGOG's final mission diagram.

6.4 Future Opportunities: Literacies Practiced by Puppetmasters

> *"When kids learn to design games they not only learn how to explore the possibility space of a set of rules but also learn to understand and evaluate a game's meaning as the product of relationships between elements in a dynamic system." - (Salen, 2007, pp. 318–319)*

In this section, I focus on the learning analytic lens of my study to uncover possible responses to my second research question (Chapter 1, p. 10): *How can ARG-design enable and foster collaborative learning and 21st century literacy practices?* Thus far in my dissertation, responses to this question have been pointed toward *players* – specifically, how can ARG designers explicitly integrate opportunities, models, and scaffolds for teen players to practice new media literacies into the ARG experiences that they are creating? However, the experiences of Heather and her teens suggest opportunities for future studies that explore the effects of involving youth in the ARG design process.

Throughout my analysis of the Finksbrary design sessions, design wiki, and interview transcripts, I found evidence that the teen designers were engaging in the same new media literacies that the *AGOG* team had worked to explicitly engineer into their ARG. Their active participation as designers in the Finksbrary ARGs afforded

them opportunities to engage in "*design thinking*," or ways of viewing and analyzing problems that lead to the identification, testing, and implementation of creative, systems-based solutions (T. Brown, 2008; Peppler & Kafai, 2009).

Research in game-based learning, game design, and e-textiles design has demonstrated the problem-solving expertise and increased agency that children can derive from their active participation in *design thinking* (Fields, Kafai, & Searle, 2012; Y. B. Kafai, 1996; Yasmin B. Kafai, Fields, & Searle, 2012; Squire, 2011). Several of these studies have found that when involved in game design or "maker" processes, youth are not only learning skills that may help them earn jobs in the game industry or craft guilds (e.g., film production), but they are also building "technical, technological, artistic, cognitive, social, and linguistic skills suitable for our current and future world…displaying media literacy in both old and new forms of reading and writing" (Salen, 2007, p. 304).

Designing with youth can also enhance our understanding of the conceptual processes of the learners themselves (Ahn et al., 2012; Bonsignore, Ahn, et al., 2013), and have shown potential to benefit the learners who participate in their design (Guha, Druin, & Fails, 2010). Consequently, in the following sections, rather than examining the effects of ARG interaction on players, I turn the lens of learning and literacy from ARG players to the Finksbrary teen designers, focusing on how they reported the ways in which they were personally affected by their involvement in the ARG design process. My current analysis is descriptive only; however, it points toward opportunities that future design-based research studies may take, asking: *How might youth like the Finksbrary teens be influenced to acquire and develop new*

media literacy skills through their role as designers of participatory transmedia experiences like ARGs?

6.4.1 The Finksbrary teens and UMF literacies

> *"Much reflection-in-action hinges on the experience of surprise. When intuitive, spontaneous performance yields nothing more than the results expected for it, then we tend not to think about it. But when intuitive performance leads to surprises, pleasing and promising or unwanted, we may respond by reflecting in action."*
>
> *- Schon, 1984*

Game design and play have often been described by games-based learning scholars as models of interaction that are "rooted in reflection-in-action" (Salen, 2007, p. 302; Salen & Zimmerman, 2003). Effectively, game designers engage in a reflective design process as they iteratively develop rules of play, and then playtest, evaluate, and modify those rules. The Finksbrary teens actively engaged in reflection-in-action over the course of the 10 months that I observed them as they designed *Run Red Run*. During these design sessions, I was often surprised by the ways in which their "intuitive, spontaneous performance" (Schon, 1984) of being savvy but silly teens also shed light on their ability to think systematically and carefully about the experiences they were designing for their peers.

While the teens arguably engaged in each of the seven UMF meta-literacies (Figure 2.5), I focus on those that seemed to evolve in novel ways throughout their three-year design experience (e.g., "Respect"). Many of the instances described below involved more than one skill. For example, the teens demonstrated their growing awareness of honoring diverse opinions and identities ("Respect" from the UMF) and an understanding of how to collaborate with others ("Collaborate" from the UMF) as they worked to create activities that they felt other teens (and their parents) would feel

comfortable participating in. Overall, the ways in which Heather included her teens in design decisions and the creation of ARG content (puzzles, narrative-related blog posts) offer insights for future designers to *promote literacy practices with youth when creating ARGs for youth*.

6.4.2 Create (Creating, Remixing, and Modifying)

The "Create" meta-literacy from the UMF includes actions like creating, remixing, and modifying, and signifies "the ability to meaningfully produce and remix artifacts and resources to express new understandings and insights (Bonsignore, Hansen, Kraus, & Ruppel, 2012, p. 40). Throughout their three-year involvement in the Finksbrary ARG team, the teen designers created many different types of content: they wrote character posts for in-game characters such as Chelsie, Abigail Spencer, and Magnus Carter; they developed fictional reasons why the crystals would be important to Chesia, building upon what they had learned about the resources that Native Americans used; they made new story extensions for existing works like *Alice in Wonderland* and *Little Red Riding Hood*; they helped write the scripts for and act out videos for their characters and also recorded audio. Their sample blog posts demonstrate the unique teen voices that they brought to the projects, as well as a growing understanding of writing to a specific player audience (their fellow teens) with subtle clues and questions to guide them. Before posting them publicly, they shared and discussed revisions for the following draft blog entries on the Finksbrary design wikis for *Find Chesia* and *Mystery Guest*.

In addition to the blog posts that the teens created for their ARGs, they began to experiment with writing and creating in other venues. Kitty and Caroline won teen writing contests during the summer that they worked on *Mystery Guest*. Rosie

Table 6.1: Sample Blog posts created by the Finksbrary Teen Designers

1. Find Chesia, "Citrine Post" (Chelsea) *Hey guys, Chelsie here :) Didja know citrines are a type of yellow quartz? They are the 2nd most popular quartz! Amethyst is the most popular. They are said to have healing powers if injested. Cool, huh? My bracelet has one. I'm really paying attention to science now. It gives me a connection to my parents.* *Well, bye for now! :)* *p.s. I've got big plans for my science fair project. I'll spill l8tr, I'm busy now!*
2. Find Chesia, EMERALDS post (Chelsea) *Hey guys!* *In Science class today we learned about crystals. Did you know emeralds have metal in them? The metal reflects light. Different metals give the crystal different colors. Cool huh? :) Emeralds are my favorite gem.* *Later,* *Chelsie* *p.s. Remember - post a comment if you know or find out anything about my parents.*
3. Mystery Guest, "Kitty's" first post *I'm not going to sugarcoat this or anything, but I'm TOTALLY FREAKING OUT. We all are.* *I mean, what would you do if you just saw something fall out of the sky? Or, in this case, a book? We're all in chicken-with-the-head-cut-off mode, just a little less bloody.* *We're also really confused. Who the heck is this guy? Why is he here? Why did he fall out of a freaking book?* *By the way, I'm Kitty. In the video, I'm the person screaming in the background. I also found the book. Introductions are important and all, but the only question I'm thinking about right now is* ***what do we do next?***

started her own personal blog about the same time as they were writing blogs for *Find Chesia*. During her post-game interview, Rosie noted that although her own blog and the posts that she wrote for the Finksbrary ARGs were "so little," she still felt as though she had made a statement for her library community:

> **Rosie**: *I was also getting so invested in something which seems so insignificant at the time. I mean like -- Imagine.* ***14 years old. Blogging****. You're not gonna get many people to read* ***that****. Definitely, it's changed my perspective on a lot of things. I mean like, something so little - I mean, I* ***just put words out*** *onto the blogosphere... and heaven knows that that's a really* ***big place*** *for putting words... but it's just -- it was an experience that*

> *definitely changed me for the better. I feel like I created something that was definitely a lot -- it definitely did something. It definitely brought awareness to the fact that libraries aren't **just** for books, dude* (Personal interview, January, 2012).

Heather was pleased that the teens' involvement as ARG designers was, in some cases, the first experience they had with wikis, and online collaborative writing:

> **Heather**: *None of the girls had worked on wikis before; none of them had their own blog yet, so when we did a lot of that, it was new to them. They just took to it and loved it. Heidi said in a meeting, "I'd **never heard** of wikis, but I **love** wikis." And I think this is another thing with teens and the Internet: we believe that they already know everything that's out there. We assume that they're better at navigating the Internet than we are. And they might be better at using the computer and the mouse interaction and all that, but they don't – their brains don't -- process the information in the same way as adults* (H. Owings, personal interview, September 2012).

Finally, the teens' responsibilities and identities as teen puppetmasters proved very important to them, and spurred them to continue to create. In her interview, Rosie mentioned that, as a puppetmaster, "*You got to **create** -- you got to throw a **monkey wrench** into all sorts of stuff*" and Kitty noted that "*It was like writing a **BIG** story with lots of people…that was cool*" (personal interviews, December 2011 and January 2012). The excerpt below, from one of their first comment-based dialogues on the *Find Chesia* design wiki, reflects the pride they felt as creative puppetmasters:

> **Heidi***: y r we called puppet masters???*
>
> **Kitty***: we are the puppet masters because we work behind the scenes and control everything*
>
> **Heather***: Kitty's right, we're puppet masters because we are working the strings behind the scenes… .*
>
> **Heidi***: Yay! We are puppet masters... (suspenseful music)... We are all powerful!!!! (beating drum).*
>
> (*Find Chesia* design wiki, June 2008.)

6.4.3 Respect (acting ethically, respectfully, and legally)

The "Respect" meta-literacy from the UMF includes the actions "acting ethically, respectfully, and legally," and signifies the "ability to honor diverse

opinions, identities, and behaviors; and to act within ethical and legal frameworks" (Bonsignore, Hansen, Kraus, & Ruppel, 2012, p. 43). The Finksbrary teens demonstrated their efforts to practice "respect" for others most when they discussed Internet Safety issues with Heather and each other, and when they told Heather about the concerns they had about misrepresenting themselves online. This theme recurred repeatedly throughout Chapter 5 (*Finksbrary Case*), especially during design sessions where the teens discussed the pros and cons of adhering closely to the TINAG principle of ARG design. In addition to the awareness that the teen designers repeatedly displayed regarding Internet Safety, they were also sensitive to the fact that their ARGs were also played by children younger than teens, so they wanted to ensure content was accessible. For example, Rosie had the following to say about the team's design decision to keep all online game content on one team only:

> **Rosie***: 'Cuz also, we wanted to make sure that kids that were younger, that, like if we had like 9 or 10 year olds... trying to get on the blog... It would be easier for them to follow... instead of them going "Wait -- which blog am I supposed to be on right now?" It was all one complete blog. So that they didn't have to be hopping around all over the Internet...which can kind of be* ***potentially*** *dangerous. We wanted to make sure that one: Kids were safe and two it was easy to get access to* (Personal interview, January 2012).

In addition to concerns related to misrepresentation and Internet Safety, at one point during the design process for *Mystery Guest*, Heather posed a question on the wiki asking how they might encourage teams of collaborators to work on in-library puzzles. The big concern that arose from Heather's question was whether participating teens should be arranging in-person meet-ups in an online space:

> **Kitty***: i dunno bout the group thing. my parents wud FLIP if i said i was meeting someone i didnt no... it took them 4 EVR 2 let me even do this, and ur part of the library!!!!! she sat in on the 1st meeting...*
>
> **Heidi**: *You just team up with friends, and play together, you don't even get together.*

> **Kitty**: *Oh ok. Im glad u already no the ppl.*

The teen designers' appropriation and practice of "Respect" was not just limited to online safety or parental oversight, however. When they started to develop their ARG narratives by building from existing works of literature, Heather and Millie took the opportunity to discuss issues related to intellectual property and intellectual rights, such as the concept of fair use, and how to determine if a work is in the public domain. On the design wikis for both *Run Red Run* and *Mystery Guest*, Heather compiled a brainstorming list of fairy tales and other works that were in the public domain so that the teens could brainstorm how they might build from the existing stories to create new extensions. As Rosie explained,

> **Rosie**: *[Tim Burton's Alice in Wonderland] movie was also coming out that same year. So it was like - Wait. This is awesome. This is kind of perfect. Dude. We should totally do this before the movie comes out so we don't run into legality things. ... We have to worry about legalities and all sorts of stuff like that... That was another reason why we picked* Alice in Wonderland. *'Cuz -- it's -- we can write about it and we can "change it"...quote-unquote... we can change to a certain point because it's...public domain now.*

In addition to their growing awareness of online policy-related issues like fair use and Internet safety, Rosie and Kitty mentioned that they both felt as though creating the ARG was not just a collaborative exercise, but it was an opportunity to be part of a larger community, " *a conglomeration of people coming together to try to meet an end-goal*" (Kitty, personal interview, January 2012). While a community sensibility is also closely tied to the "Collaborate" literacy from the UMF, it also reflects the "ability to honor diverse opinions, identities, and behaviors" in an expansive way. The perspectives they outline below reflect two overlapping UMF literacies, *Respect*, and *Collaboration*.

> **Kitty**: *Planning it was fun. It was like writing a* **BIG** *story with lots of people…and then, putting it – helping put it into your real life. It was….that was cool" (personal interview, December 2011).*

> **Rosie**: *…You can get so many people together and they come together and they* ***support*** *each other and they* ***help*** *each other out and you're getting a* ***great community*** *factor there. I mean an ARG doesn't just have to be a game. It can be a chance to get a community together to work for something. It's fantastic to see it actually work.*

6.4.4 Solve (problem-solving, experimenting, and innovating)

The "Solve" meta-literacy from the UMF includes the actions "problem-solving, experimenting, and innovating" and signifies the "ability to innovate and experiment to creatively solve problems and reach goals" (Bonsignore, Hansen, Kraus, & Ruppel, 2012, p. 38). Just as the Finksbrary designers had to create all of the narrative and interactive puzzle content for their ARGs throughout their three-year design process, they also had to solve problems continually. As Kitty explained in her post-game interview, designing involved problem-solving and troubleshooting:

> **Kitty**: ***Making*** *it, that was cool. 'Cuz you had to figure out the different kinds of puzzles. It was sort of a lot of problem-solving. … It was kinda hard to [integrate puzzles into the story]. 'Cuz for some of the things, without transportation you might not be able to do some of the things - so you can't be like, "Go to this public park or something...and do this..." That was hard. Then you had to figure out different kinds of puzzles. 'Cuz you can't just use a code every time. You have to... be different. And then you had to make them all accessible which means that they -- you don't have to go into the public library and be on the website every time...and that really limits you... … It's a lot of work. It's* ***fun****, but it's a* ***lot*** *of work. ...* ***Designing*** *is a lot of work. ...* ***Designing*** *it though, that was a lot of fun.*

> **Interviewer**: *What do you think people learn when they play the game?*

> **Kitty**: *Hmm. Huh. I learned a lot about* ***troubleshooting****. Probably. Just 'cuz a lot of the stuff didn't work. And then you're like... already halfway into the game and you're like, "Oh, I can't go back and fix it" and we needed to make up for it somehow.*

> **Interviewer**: *Oh, you mean, when you design it?*

> **Kitty**: *Yeah. Or even like when the people are playing it... you've already like designed a part of it and you're like -* ***whoa*** *- that won't work. And you need* ***five*** *people to do this [puzzle] and you only have* ***two****... And then... Yeah. And then you really gotta -- you gotta* ***think*** *about it... about things* ***before*** *you start it.*

6.4.5 The importance of Play

A key activity that Heather tried to promote with her teen designers is part of the New Media Literacies and Participatory Cultures framework (Jenkins et al., 2006), not the UMF. I include it because it is closely related to problem-solving, and also reflects the philosophy that Heather used in her design sessions with the Finksbrary teens. The literacy skill that Heather promoted is "Play: the capacity to experiment with one's surroundings as a form of problem-solving" (Jenkins et al., 2006, p. xiv) Throughout my discussion of the Finksbrary case, I have noted the positive impact that Heather made on her teen designers throughout their three-year design process. Heather's willingness to give her teen designers room to experiment, brainstorm, and play with many ideas and many different storylines contrasts with more "teacher-centered" approaches to learning, in which "student responses provide springboards for teacher explanations" (Hmelo-Silver & Barrows, 2006, p. 22). Instead, Heather's actions during the team's design sessions resembled a technique known as the "reflective toss" (Hmelo-Silver & Barrows, 2006; Schoenfeld, 1998). In a reflective toss, an educator takes a student statement, paraphrases or summarizes it and then "throws responsibility for elaboration back to the student" (Hmelo-Silver & Barrows, 2006, p. 22). For example, the educator/facilitator will ask for clarification on a problem, or will ask the group what they think about proposed concepts or opinions. The metaphor of the reflective toss is grounded in the notion of interactive play – that an educator or facilitator gives learners the permission to play and to enable them to take risks rather than fearing failure in an assessment-driven culture.

In one of her longer reflections and responses to my question about what advice she would give to other librarians and educators who might want to create an

ARG team like hers, she expressed her desire to give her puppetmasters and players more opportunities to play around without concerning themselves with making mistakes. She compared play to Tina Fey's "rules of improvisation" (Fey, 2013) and emphasized that developing a confidence in and ability to "play" was a skill that should be developed through the ARG design process.

> **Interviewer:** *What would you tell other librarians...about doing something like this...who get excited about McGonigal like you did...What would you say...?*
>
> **Heather:** *Wow....um... I mean I think it's an awesome idea. Honestly, it's very hard to tell anybody to do it, because to be honest...a lot of it, we learned along the way, and **a lot** of it was **specific** to who we had working on our team, and their personality types and that sort of thing...*
>
> *But...**really** where the **optimum** ARG experience as far **puppetmasters** go - it would be like the ability to ...almost to "**play along**." Y'Know, there was a real **hesitance** and resistance to throw something out there because they didn't have that "oh, I'll just play along with this...I'll take this and run with it" kind of attitude...It's almost uh...I **hate** to say **spontaneous**, because they were **all very** spontaneous and off-the-cuff and stuff like that, but it is almost like a **hesitancy** to -- to do something **wrong** -- like that, that they would get in **trouble** for...*
>
> **Interviewer:** *…to take a risk, maybe?*
>
> **Heather:** *Yeah, to take a risk. Well, in Tina Fey's book,* Bossy Pants*, she talks about the rules of Improv. And one of the rules of improv was to say, "Yes" and then to play along, and then build on it. If someone was to say to you, "Freeze! I've got a gun!" You don't say, "That's **not** a gun - that's your **hand.**" You **play along**, y'know what I mean? And I don't know that teens have that... As much as I've studied the teen brain and worked with teens I just sometimes wonder if this is a sophisticated thinking mechanism that they just don't have yet, y'know. And also -- we have such a **protective culture**, maybe we don't **encourage** them to do things like that.*
>
> *So - the other thing is that -- **not only** do you play along but you **build** on it. So, if someone holds their fingers as a gun and they say "Freeze, I've got a gun!" maybe you throw up your hands and you scream and say, "Ah, I don't have any cash!" Y"know what I mean...? You **keep it going**.*
>
> **Interviewer**: *That's great. So, you think… more emphasis on playfulness, or risk-taking…like Improv…?*
>
> **Heather**: *Yeah, exactly. And, maybe reiterating that there's **no wrong way** to go about this – Like, we can make **anything** work kind of attitude. Again it goes back to that educational piece where we're like "Oh the Internet. **Don't** do this, **don't** do this, **don't** do that. Maybe in order to make this work **with teens** we should have been like: "**Okay**, this is what we want you to do - be playful, throw things out there. We'll work with it.*

> *And like I said, I feel we had that feeling a lot more in* Mystery Guest *because all four of them had voices, and less in* Run Red Run*. Y'know, because we only had the one voice with Red, and all four girls were contributing to the same one. I just felt with Mystery Guest - they, they were more participatory and they were more involved like that. …*
>
> **Interviewer**: *Is there maybe an optimum structure that maybe a librarian might need to think about in terms of designing one of these ARGs in say, in a school system?*
>
> **Heather***: I think that what you want from your players is again the same as what you want from your puppetmasters. You want them to be playful; you want them to take risks. And you want them to kind of know that there's* ***no right*** *or* ***wrong answer****. I don't know how you would present that in your game format to get that across, other than through* ***modeling…*** *and that's where the puppetmasters' beliefs and risk-taking would come in --they could model it for their peers and their peer group.*
>
> *And honestly, I think that that is what would make a* ***successful ARG*** *- so it's almost like you need to* ***build *those* skills -- focus more on those skills*** *-- and maybe less on the technology... Like to build an ARG team, you know?*

While this was a longer interview excerpt, I include it here because it reflects a theme and philosophy that Heather emphasized often, in both of her interviews, and one that she conveyed throughout her design sessions with her teens, and even through game play. In her own blog posts as the librarian in *Mystery Guest*, she tried to promote players' efforts to participate in positive, humorous ways, rather than, as she said, emphasizing what they should <u>not</u> do online. She reserved player constraints to the "*Rules of Gameplay*" guidelines that she and the teens posted on their game websites. Heather's "permission to play" influenced the girls to experiment and enabled them to enact most, if not all of the other literacies. Her interview comments underscore an important strategy for future designers and researchers who develop ARGs and similar interactive experiences with and for teens.

6.5 Participatory Design for a Participatory Game

> *When we did the Find Chesia pros and cons list on a whiteboard, I took a photograph of it. We wrote down notes for the wiki too, but I photographed it because… it had all of our handwriting on it. It wasn't* ***just one*** *of us, putting in the pro and cons, y'know. I thought it was a really wonderful example of our* ***cooperative energy*** (H. Owings, personal interview, November 2010).

Throughout my examination of existing ARGs and the Finksbrary design case, I have explored the ways in which designers strive to ensure that their ARGs allow as much open-ended, dynamic interaction and participatory storytelling with players as possible. The *ILB* and *Beast* designers, for example, allowed players to dynamically revise the intended storyline as it unfolded, which sometimes required rewrites of entire episodes. In the Finksbrary design case, however, the participatory process shifted from game *play* to game *design.* Rather than asking about the challenges that designers encounter and the strategies that seem to work well when creating ARGs for teens in learning contexts, a new question began to emerge: *What can you learn from the design process of an ARG when you actively involve members of your target audience in that process of design?*

Rather than simply exploring the ways in which ARGs involve teens in an unfolding narrative during gameplay, Heather decided to *include* teens in the process of *creating* an ARG narrative. In doing so, Heather not only gained insight into effective design strategies for ARGs that target teens, she also gained insight into the knowledge, attitudes, and awareness that her teen designers brought to the process. As she noted in her interviews: "*We garnered a lot of information from designing together that we use in our teen programs even today*" (H. Owings, personal interview, September 2012). The Finksbrary team's games attracted only a small number of players overall; however, all of the designers felt the experience they had gained through the design process was rewarding. As Rosie noted regarding the thrill she experienced as a "puppetmaster:"

> **Rosie***: I felt all cool and like "puppet-mastery" and I mean, I was a dorky little 14 year old ... It was great, actually. ...You knew everything that was going on. You got to* ***create*** *-- you got to throw a* ***monkey wrench*** *into all sorts of*

> *stuff... You got to say, you know what, I want this person to be the bad guy but they [the players] don't know it's the bad guy -- they think it's the good guy* (Personal interview, January, 2012).

Heather felt that her teen design team not only helped liven up the ARGs they designed, but they also gave her insights into the ways in which her teen patrons wanted to interact with the library:

> **Heather:** *They just loved it and they're quite, they're quite devoted and they're excellent readers so you know, I really feel that, they add that element to it, you know they have that…well,* ***they're on target*** *for what books kids are reading and what books are interesting. Millie and I read a lot in the YA section, but we don't tend to read what the teens are reading and what they find popular or that they find interesting. So we found it interesting to listen to them because the books that they're bringing to us are not necessarily one's that we saw the review in for, you know, in the School Library Journal or Publishers Weekly. A lot of the books that they bring -- some of 'em we've never heard of. So* ***they're helping us … see through the cracks in the collection****, and I think that adds something interesting to a library-run game.* (H. Owings, personal interview, November, 2010).

The Finksbrary design case is one of the first emerging ARG studies to touch on the process of including a teen target audience in its design process. Muscat (Muscat, 2013) and Jagoda et al. (in press) are the only documented studies that have designed ARGs with teens prior to 2014, while Colvert (Colvert, 2009) is the only know ARG designed in a learning context by tweens (10-12 year olds). Although the use of participatory design methods for creating ARGs is not a primary focus of my research questions, Heather's approach and the Finksbrary design case overall points to the potential that participatory design holds for creating ARGS in learning contexts.

Chapter 7: Conclusion

Several design themes have been raised throughout this dissertation, from the analysis of interviews with expert designers through both design cases. In this chapter I highlight some of those themes and focus specifically on their implications for design. I temper the findings and themes I have uncovered with the limitations of my study. I also suggest potentially useful avenues for future research in the design of ARGs and similar transmedia experiences.

7.1 Contributions

The contributions of my study include theoretical insights that may advance our understanding of narrative design and analysis as well as more practical design implications for designers and practitioners seeking to incorporate transmedia and ARG features into learning experiences that target youth (13-17 years old).

7.1.1 Theoretical Contribution: ARG Narrative Design Framework

As shown throughout this dissertation, narrative is a key component of ARG design and game play. Narrative is also a fundamental and pervasive element of human experience. Whether they were etched on cave walls 40 millennia ago or stained glass windows 500 years ago; embedded in multiple media traced across multiple hypertext links or inscribed in print; encapsulated in 140 characters or everyday moments captured within petabytes of big data, we encounter stories everywhere, in every aspect of our lives (Barthes & Duisit, 1975; Seely-Brown, Denning, Prusak, & Groh, 2004; van Dam, Balsamo, Brinkman, & Watrall, 2013). Narrative is also an interactive experience. The interaction between reader and text or spectator and spectacle has never been entirely passive (Aarseth, 1997; Rosenblatt, 1994) Over the past few decades, the growth of digital, networked, mobile and

pervasive technologies has enabled increasingly interactive narrative formats that not only invite but also require reader/audience participation (Bizzocchi, Lin, & Tanenbaum, 2011; Wardrip-Fruin & Harrigan, 2004). As shown in my literature review, researchers and designers across a wide range of disciplines, such as artificial intelligence, humanities, game studies, and performance art, are exploring design strategies for immersive stories that people can play (Bizzocchi et al., 2011; Montola et al., 2009; Thompson, 2010; Wardrip-Fruin & Harrigan, 2004). In game design research and in the gaming industry, there persists a theoretical and practical interest in analyzing the relationship between game and narrative (Salen & Zimmerman, 2003; Wardrip-Fruin & Harrigan, 2004). The core interaction mechanism in ARGs is a distributed, transmedia story. How might we frame the various types of narrative structures used by ARG designers?

Based on ARG analysis outlined in Chapter 2, which was derived through content analysis of a representative sample of ARGs and interview transcripts by game designers and researchers, I have proposed a narrative design framework (Figures 6.3 and 6.4) that allows for the categorization of ARGs from close-ended, designer-orchestrated transmedia structures to open-ended, emergent stories co-created by players/designers. The framework can serve as an analytic tool for researchers aiming to describe ARGs and similar transmedia productions, and it may also serve as a guide for designers who are creating ARGs and related transmedia experiences. I have used the framework to characterize both *AGOG* and the Finksbrary ARGs as close-ended, designer-orchestrated experiences.

7.1.2 Practical Contribution: ARG Narrative Design Techniques for Engagement

Given that the core interaction mechanism in ARGs is a distributed, transmedia story, ARG designers must devise ways to:

1) Lead players across media and platforms that contain interactive story fragments (J. Y. Kim et al., 2009; A. Martin et al., 2006); and

2) Support player efforts to add to the collective experience with their own interpretations and contributions to the evolving storyline (Dena, 2008a; J. Y. Kim et al., 2008b; McGonigal, 2008a).

These goals hold true even in the case of *AGOG* and the Finksbrary design cases, whose ARGs may have been less distributed than adult-oriented experiences from the entertainment industry, but still retained diverse use of multimedia and interactive player activities.

Related to the ARG narrative design framework, and tied to the player engagement goals listed above, I have also identified several design techniques, in the form of questions, which ARG designers can pose to guide their narrative design process. These questions can be further divided into two categories of player engagement: *points of convergence* and *counterfactual gaps*, or the *absence of narrative information*. While the questions are simple, they offer ways for designers to the interrogate narrative elements they are creating that are similar to approaches such as game designer Jesse Schell's *Deck of Lenses* (2014), and game designer Mary Flanagan's *Grow A Game*. These card-based games pose questions that help guide design decisions for practitioners and researchers. In this way, the questions attempt to go beyond existing narrative tropes, demonstrating ways to 1) map physical artifacts and places scattered across multiple, everyday media and platforms into a

macro-story (e.g., stories about objects in a museum repository, gaps in historical records); and then 2) incite players to share their interpretations in the same way: "*The little narratives of our lives may not seem like much—but the cautionary tale my friend tells me is much more likely to persuade me of something than anything James Cameron will produce. I try to create a space that encourages people to make these stories they find meaningful – that's what authentic fiction is about*" (K. Eklund, personal interview, August 2013).

7.1.2 Theoretical Contribution: Typology of Keystone Roles for ARGs

Based on my analysis of existing ARGs in the literature review in Chapter 2, as well as the design process followed by the design teams in the *AGOG* and Finksbrary cases, I have identified a typology of "keystone species," or specific roles and associated behaviors that designers can implement to positively impact player participation in ARGs and similar transmedia storytelling experiences. Specifically, I have highlighted approaches used for incorporating these roles in ARGs designed for learning contexts (formal and informal), using the *AGOG* and Finksbrary design cases as empirical examples. In contrast to previous studies of ARGs that focus on social roles and behaviors assumed and enacted by players and player communities, my analysis reveals social roles explicitly created *by designers*. Designer-crafted social roles such as the protagonist-by-proxy and protagonist-mentor can be integrated into the ARG narrative, while others such as community conduits and "planted" or proxy players are enacted primarily during gameplay only.

7.1.3 Practical Contribution: Implementing Keystone Roles in ARGs for learning

The keystone roles I outlined in Chapters 2 and summarized through the *AGOG* and Finksbrary design cases hold implications for use in the design and play of ARGs for learning. Educators (whether in informal or formal education contexts) or older students could assume roles as community leads and encourage more hesitant players. The protagonist-by-proxy could be used to model target literacy practices as well as motivate players on a peer-to-peer level (Bonsignore, Hansen, et al., 2013; Bonsignore, Hansen, Kraus, Ahn, et al., 2012). The protagonist-mentor may be especially crucial for informal learning contexts where teen players need more explicit guidance on how to interact with distributed and open-ended features characteristic of ARGs. Due to the protagonist-by-proxy's and protagonist-mentor's narrative-centric role, much of these characters' interactive content can be created in advance of game launch and thus offer opportunities for reuse (Hansen et al., 2013).

7.1.4 Practical Contribution: Design Implications for Practitioners and Researchers

In addition to theoretical and practical contributions related to the design of ARG narratives and characters, I have outlined recommended design strategies for tailoring the ARG design principles of *Transmedia Interface, Participatory Narrative, and Authenticity* for teen audiences in learning contexts. For example, the *AGOG* team applied techniques from Cooperative Learning frameworks (D. Johnson et al., 1994) to encourage both individual accountability in learning new skills (e.g., cryptography) and collaboration. In addition, *AGOG* showed that designing for *scaffolded progression* through individual training missions so that players could gradually increase their participation and skill levels as they advanced toward the final collaborative mission (Bonsignore, Hansen, et al., 2013).

Figure 7.1 Repertoire of Design Strategies, represented as a "design deck" of cards.

7.2 Limitations

Although I have proposed several design recommendations and theoretical frameworks, there remain several limitations to my study overall. The first limitation is tied to the scale and consequent generalizability of my study. Although I was able to follow two small design teams throughout a relatively long-term design process (each for approximately one year of close observation), the ARGs they designed were implemented on a small-scale, and each ARG was only played once. Given the wide range of ARGs that have been and can be implemented, these two cases cannot lead to *statistical generalizations* for all ARGs -- or even the growing body of ARGs focused on learning contexts (Yin, 2009, pp. 38–40). Rather, my focus has been on *analytic generalization*, which is focused on building propositions from existing

theories, such as socio-cultural views of literacy, new media literacy frameworks, facilitator-modeling behaviors (Yin, 2009, pp. 38–40). Relatedly, the target audience for the ARG design cases that I have investigated is an adolescent player base, with a focus on younger teens (13-15 years old). Consequently, I cannot propose with certainty that any of the findings will translate to older players.

A second limitation relates to timeframe, and the available evidence from my study that *AGOG* or the Finksbrary ARGs resulted in increased learning and literacy development for players. While I have qualitative evidence that suggests that *AGOG* promoted collaboration amongst its teen players, and that long-term membership on an ARG design team enabled the Finksbrary teens to develop new media literacies that they would not have otherwise, I did not conduct any rigorous pre- or post-assessments that could statistically support my more qualitative analytic approach. Indeed, *AGOG* gameplay itself only covered two weeks in a busy academic year, with dedicated play limited to two middle school class periods per day (approximately one hour per class). While I was able to collect survey data from the middle school students who played *AGOG*, I was not able to observe any long-term effects of play. At most, I was able to receive anecdotal evidence from the teacher and librarian who participated in *AGOG* that, based on an end-of-school-year survey given to all eighth graders, the students who had played the ARG highlighted it as one of the most interesting experiences of their year.

A third limitation relates to scope of observation and analysis. For *AGOG*'s game play, I was limited to in-class observations of gameplay (and associated field notes) and behavioral trace data (Leander, 2008; Price, Jewitt, & Brown, 2013;

Rotman, Preece, He, & Druin, 2012) from the *AGOG* community player site (juntolives.org). I was not able to interview any of the players or observe any differences in their behaviors outside of the social studies classroom in which they participated in the ARG. For *AGOG's* design process, more data was available; however, to keep data analysis manageable, I had to focus coding on select excerpts rather than the entire corpus of design meeting recordings and design wiki data. For the Finksbrary case, while I had access to all of their design sessions (for the final year) and design wikis (for all three years), I did not observe their game-running process. While the data I collected and analyzed offered rich insights into the design processes that both teams followed, they were limited in time and scope.

7.3 Looking to the Future

When I set out to join the larger ARG research project of which my dissertation study is a part, I was motivated by existing views in HCI and learning sciences communities that more design-based examples are needed to develop and establish effective models for game-based learning (Isbister et al., 2010; Salen, 2008; Squire, 2006). I was particularly interested in the role that the ARG's participatory, multimodal narrative might play in helping youth engage in lifelong learning and literacy practices. I was also hopeful that I could make a case for including teens in the actual ARG design process. Both the *AGOG* and the Finksbrary design cases build upon a growing body of research that examines the potential for ARGs to be novel learning experiences (e.g., Bonsignore, Hansen, Kraus, Ahn, et al., 2012; Colvert, 2009; Niemeyer et al., 2009; Whitton, 2008). The *AGOG* findings have yielded insights for the types of designs that can promote collaborative sense-making

and counterfactual reasoning for teens (13-15 years old) in formal learning contexts. In addition, the Finksbrary case has highlighted the potential importance of including teens themselves in the design process. My findings build upon existing research by focusing on opportunities and challenges that designers face when creating and implementing ARGs for teens and with teens. My contribution offers an early foundation of best practices for designers/educators to follow when implementing ARGs and similar immersive learning environments for teens.

But this is just one study of two small-scale ARG design teams. Similar case studies are needed by designers and educators to test these design implications in their own learning contexts. Future work includes 1) evaluating design strategies for reuse (Hansen et al., 2013), such as resetting private player community website data whenever an ARG is restarted, or recruiting players who are experienced with an ARG narrative to extend it with their own player-produced "chapters" or installments; 2) devising ways to develop a protagonist-by-proxy model that not only engages individuals who are already playing, but could also help recruit larger player populations; 3) investigating the impact of visual markers on player efforts to critically evaluate ARG narrative information and to distinguish between factual and fictive elements more effectively; and 4) including more children and teens in the design of ARGs and similar interactive, immersive learning experiences. I hopefully envision that design partnerships with teens will not only result in the creation of engaging participatory narrative productions like ARGs, but can also yield new insights about the ways in which youth conceptualize and reflect upon the learning that these transmedia experiences can promote.

Glossary

Alternate Reality Game (ARG)

Although ARGs are described in detail throughout this dissertation, a brief definition highlighting their most distinctive characteristics is recapitulated here. An ARG is an interactive story that demands players' active participation. The narrative embedded within an ARG does not continue unless players do something; often, the players can actually even influence the storyline as they interact with in-game characters in real-time. ARG players engage with the narrative content as themselves, not via role-playing or avatars, using everyday communications tools and techniques, such as phones, web, e-mail, print texts, and in-person interaction.

Game Mechanic

A "core mechanic" in a game is defined as "the experiential building block of player interactivity, which represents the essential moment-to-moment activity of the player…and is the mechanism through which players make meaningful choices" (Salen, p. 268). Consider actions and choices such as "talking," "trading," "capturing territory" and "taking cover" as game mechanics that enable players to interact with the game space. In fact, game designers often refer to game mechanics as the "verbs" that are designed into game play (Crawford, 2003; Järvinen, 2009; Sicart, 2008). Game mechanics, and their relation to narrative flow, are key design issues for education-based ARGs (and games for learning in general), as the actions that players must take can be mapped to specific learning and literacy goals/activities, such as evaluating information, navigating across media, collaborating, and creating.

Human-Computer Interaction (and Interaction Design)

The media and platforms used to distribute an ARG's story, and the social technologies used by players to share it are primarily products of human-computer interaction design. Consider the working definition of HCI, published in 1992 by members from the Computer-Human Interaction Special Interest Group of the Association for Computing Machinery (ACM SIGCHI):

"Human-computer interaction is a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them" (Hewett et al., 1996, p. 5).

More recently, the definition of HCI has been extended to reflect our understanding that computers are not the only product of interest to designers who strive to support human communication. The "human-computer" modifier has been dropped to emphasize that the core design goal is support for daily and lifelong human interaction regardless of tool or technique. Interaction Design (IxD) is about "designing interactive products to support the way people communicate and interact in their everyday and working lives" (Sharp, Rogers, & Preece, 2007, p. ix). For this study, we can reframe these definitions in terms of ARG design as follows: "concerned with the design and implementation of interactive ARG experiences" and "supporting the way people communicate and interact while playing an ARG."

HCI has always been a multi-disciplinary field, stemming from the complementary interests of researchers in computer science and psychology during the late 1970s and early 1980s (Shneiderman & Plaisant, 2010). Over the past 4 decades, HCI research has grown even more interdisciplinary, and now includes scholars and practitioners from information studies, computer science, education,

psychology, sociology, linguistics, engineering, and digital humanities, among others (Lazar et al., 2010). Likewise, ARG design teams include individuals collaborating from diverse disciplines to create engaging human experiences using technology.

Information Ecology

As used in this study and defined by Nardi and O'Day, an information ecology is "a system of people, practices, values, and technologies in a particular local environment," in which the emphasis is "not on technology, but on human activities that are served by technology" (2000, p. 49).

Puppetmaster

An individual responsible for the design of an Alternate Reality Game, to include narrative elements, interaction elements specific to the game (puzzles, challenges, in-game character plot-lines), and interaction elements specific to the players (dropping hints, adding paths to trailheads).

Rabbit hole

Entry point into an ARG. For example, one of the rabbit-holes in the 2001 ARG, *The Beast*, could be found in the credits for the trailer to the A.I. movie, which listed: "Jeanine Salla as Sentient Machine Therapist." A web search for the name, Jeanine Salla, would lead to another part of the ARG's narrative. Synonym for trailhead.

This-is-not-a-game (TINAG/TING)

Willing suspension of disbelief on part of players and designers that everything happening in the game is "real"/true (Szulborski, 2005).

Trailhead

Entry point into an ARG. There may be multiple trailheads distributed across a single ARG. For example, one of the rabbit-holes in the 2001 ARG, *The Beast*, could be found in the credits for the trailer to the A.I. movie, which listed: "Jeanine Salla as Sentient Machine Therapist." A web search for the name, Jeanine Salla, would lead to another part of the ARG's narrative. Synonym for rabbit hole.

Transmedia

The term transmedia is used most often across industry and academia to describe a method of storytelling using multiple media formats, distributed across multiple platforms, with "each work contributing to a larger narrative economy" (Jenkins, 2004, p. 124). Here, the power of transmedia is not in the divergence of platforms and media used, but in the way that each interacts and supports the audience's immersion into the overall story world (Jenkins, 2004; Thompson, 2010).

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